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Il contributo della Rappresentazione nel Building Information Modeling (BIM) per la gestione del costruito

The role of BIM (Building Information Modeling) for representation and managing of built and historic artifacts

Nel campo dell'Architettura e dell'edilizia il Building Information Modeling (BIM) è ormai un riferimento fondamentale per le nuove costruzioni laddove la standardizzazione costituisca la caratteristica tipica del progetto. Diversamente, l'approccio introdotto dal BIM non risulta ancora del tutto adeguato per l'edilizia esistente e per i manufatti storici. E' indubbio che la produzione dell'Architettura, intesa come gestione dell'intero processo edilizio, richieda standardizzazione per una maggiore economia, ma questo sforzo risulta estremamente complesso quando ad essa si contrapponga l'unicità del manufatto come valore primario e vincolo di progetto.
Il presente articolo si prefigge di definire le principali criticità del BIM in relazione al patrimonio architettonico storico esistente tentando di definire le implicazioni nel settore della rappresentazione.

It's established that in the design and construction of new buildings, BIM is a fundamental reference especially when the standardization is the typical character of the project. As Architecture, with the management of the entire building process, requires standardization for greater economy, thanks to BIM tools the building process seems to have actually moved to a 2.0 phase; on the contrary, when BIM is applied to historical buildings it still reveals not so adequate.
In this framework, this paper will not discuss the differences between CAD and BIM or the undoubted potential of BIM software from a technical or operational standpoint; we would focus instead on the implication of BIM referring to the Representation disciplines and to the issues connected with its application to the existing built stock and especially to historic buildings.

parole chiave: BIM; modelli 3D; Cultural Heritage
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INTRODUCTION

About 20 years ago, the so-called digital revolution came forcefully into architectural domain radically changing the way architecture was designed, documented, represented, visualized and even built. Lines traced on paper were first confronted and then quickly overcome by digital mathematical entities (points, lines, surfaces) interactively created, edited and visualized by users using a CAD software on a personal computer.

Although technological resources were very limited in those “proto-digitalism” years (not even comparable with the computing potentials that are commonplace for us), nevertheless the main tendencies of this revolution/evolution were already quite clear: on one side, those users (the majority) who simply tried to adapt their traditional drawing tools and approaches to a new medium; on the other, a smaller number of pioneers who explored a new way of constructing architecture directly using parametric 3D objects (both in virtual and real sense). The system adopted by this second group is currently described with the acronym BIM.

In the first case, the representation respected the traditional workflow, although requiring its adaptation to CAD platforms and interaction tools and devices (mouse and keyboard instead of pencil and rulers).

The drawing changed thus its backing and its input mode, but preserved its role and main features. Users just had to perform “digitally” their tried and tested activities to achieve the standard description of any architectural object.

In the second case, instead, the descriptive character of any graphic element of the representation was enriched and enhanced by a symbolic component linking the element itself to the widest range of underlying information. This method of work took thoroughly advantage of IT potentials and especially of its ability to share and integrate different data using a graphic interface. The design outputs, traditionally made of separate products (drawings, reports, tables, programs, quantity bills, etc.), found a sort of unification in this BIM digital environment as items of a database ordered according to the single architectural element.

Through three-dimensional graphic interfaces, the different experts involved in the building process can actively interact within virtual environments. To the designer, in particular, the software ensures an extraordinary exploration tool together with the possibility of dissecting the building in all its components. In this environment, any critical interference is automatically detected and highlighted for all actors, as well as the solution proposed by the designer and its vertical and horizontal repercussions on the entire construction process.

Furthermore, because of the object-oriented BIM’s structure, each portion of the building appears to designers under a more detailed and complete light simply due to the enhanced data integration (i.e. architectural metrics in connection with structural behaviour, energy parameters, economic issues, etc.): a sort of emerging property of the system.

Each topic finds its place within a shared interactive database (the effects of any change can be immediately evaluated) being at the same time regarded for its specificity and in the overall construction context.

Thanks to BIM tools, the building process seems to have moved to a 2.0 phase and both the market and the policy makers are pushing this new “vision” for its clear economic and operational advantages. Designers, though, still are in a sort of laggard group, generally unresolved whether to abandon or not their traditional workflow (and often the investments made).

A problem that is generally regarded as “sectorial” but that instead, in our opinion, will be crucial for a real development of BIM systems and their generalized application as existing constructions represent about 70% of European whole stock.

We want thus to contribute to the debate about the potentials and the problems connected with the application to existing buildings of the standardized and rigid BIM tools (the so-called H-BIM), trying also to understand the role of non-BIM systems in this process (especially of traditional drawing).

Merging these two apparently contradictory aspects, we will try to outline an alternative route based on integration of methodologies able on the one hand to ensure more correct and verifiable results and on the other to preserve uniqueness as typical character of historic buildings.

BACKGROUND

The European Union Public Procurement Directive approved in 2014 (EUPPD/24/EU) supports in fact a new approach influencing the whole construction process (design, representation, building, management and even maintenance).

The Directive addresses obviously all EU countries and prescribes an increasing use of digital management systems (including BIM itself) making no distinction between projects starting “from scratch” and interventions involving existing structures. This choice obviously intends to optimize the resources involved in any construction process especially minimizing unexpected events, changes and eventually costs in terms of time and money.

Within this context, we must point out that the distinction between new constructions and projects involving existing ones (especially if of historic value) is not at all secondary.

Just to give an example, the Horizon 2020 Work programme highlights that: “Around a quarter of the existing building stock in Europe was building prior to the middle of the last century. Many such buildings, often valued for their cultural, architectural and historic significance, not only reflect the unique character and identity of European cities but include essential infrastructure for housing, public buildings, etc. A significant number of these historic buildings continue to use conventional inefficient fossil fuel based energy systems typically associated with high energy costs and with greater than average CO_2 emissions and cost of refurbishment “.

This will imply that practically the whole EU built stock will have to cope with energy issues in order to increase its efficiency and contribute to EU objectives

As the years ‘ 80 and ‘ 90 were characterized by urban growth through new designs, the leitmotif of present days (and of the near future) will instead shift on the improvement of existing assets that will need to undergo deep transformations without losing their architectural essence and, more in general, the historical characters of the urban context.

A key factor for the solution of this apparent aporia actually resides in the relationship between knowledge of the building (referring to its qualitative and quantitative description) and design, representing the latter maybe the most relevant interpretational activity capable to keep together complexity, costs, timing, performance and cultural values.

Beyond platforms, software, and tools it will lead to a new culture for a new design.

THE STUDY OF HISTORICAL BUILDINGS

Any historic building has in its unique and limited relationship with standardization one of its stronger and more recognizable element.

In this framework, each constituent element of the building is deeply integrated with the "whole" and often deceives a tangle of cultural and historical issues that can hardly be revealed through a simple geometric reading or a superficial study of its structure

The study of any historic building has so far implied two distinct but deeply integrated phases: an historical analysis concerning its construction and evolution; a metric and geometric survey of its three-dimensional consistency. These two phases, together, intend to achieve the deep knowledge defined by Descartes and provide a solid basis for the correct drafting of analytic outputs (drawings, schemes, etc.) essential for designing any refurbishment or restoration. Only a correct approach to knowledge, in fact, can reveal and enlighten the reasons underlying the construction and transformation of the building, as well as a correct interpretation of its geometric or technological features. According to this approach (quite different in comparison with the standards used for new buildings), any artefact cannot be considered only for its constructive and technological characteristics.

But even if we do search and identify repetitive patterns (also referring to historical periods and styles), experience shows that historic buildings often resist to any generalization each one representing a unique piece of heritage.

In this framework, traditional drawing still plays a key role for designers as one of the most powerful tools for analysing the structure of the building, disassemble it in elements and, after interpretation, reassemble them according to their function, history, role, etc.

Although the technology behind "knowledge" has dramatically improved in recent years providing fast and accurate instruments for capturing quantities and qualities of objects (i.e. 3D scanners), still there is no "smart analyser" capable to explain the reason (technical, cultural, historical) why a certain element has become part of the artefact.

But this "cultural" reasoning actually clashes with the standard efficiency requirements of any BIM system (for instance for the difficulties in highlighting and precisely positioning of interferences).

But it is paramount how any possible action must start from a shared and accepted concept of standardization that instead currently represents an unclear variable of the process despite any BIM system declares its perfect compliance with a sort of platonic, ideal standard.

We can operationally define as a block the graphical representation of each element that in this way finds a sort of standardization referring to some of its features (shape, geometry, dimension, etc.). Blocks can easily be cut, copied, pasted and inserted in the model space wherever it's necessary, but they must keep the dimensions set in the creation phase. In a BIM system, this task corresponds to the creation of an entity called family.

What is then the difference in this example between a CAD block and a BIM family? The subtle, but still deep difference lies in the level of standardization of the two approaches. It could be somehow
counterintuitive that it is greater for the block in comparison with the family as the former is less adaptable then the latter: block geometry is in fact rigidly defined at the beginning and can be changed only editing and redrawing the block itself; the geometry of a family is instead defined through parameters (i.e. dimensions or constraints) that are interactively modifiable.

In a BIM environment, instead, the "window" belongs to a family and its geometry, although governed by the same parameters used by the CAD, can edited directly in the model: in other words I can select the window, change for instance its width, and observe this change to automatically involve all windows of my model. Not only that, though: as the window family shares with the facades families a number of geometric constraints, the window modification will propagate also to the external walls that would be accordingly reshaped.

Families use parameters instead of dimensions and thus surprisingly appear more flexible than blocks for modelling also historic or existing buildings. The centre of the debate concerning the application of BIM approach to this specific structures is thus not if it is applicable, but how.

BIM FOR DESIGN

The complex software interacting in the BIM Process is based on standardization of building elements. Their main features (geometric, dimensional, material, performance, lifecycle, etc.) represent the informative attachment of each component. This object-oriented multilayer informative character actually represents one of the main advantages of BIM approach that designers can use during the creative and projectual phase as well as in the control and managerial one.

Once all relevant information concerning the building have been stored, the designer can in fact retrieve and interact with it through a 3D graphic interface able to respond to different requests: on one hand, communicate of course the project itself but, at the same time, extract any data necessary for its detailed description, components checking and problems finding

The BIM environment will besides assess the impact of each component on the overall structure and provide an easy and selective access to any typological information.

Through the representation offered by the software, the designer can simulate the actual development of the future realisation and identify critical steps and problems; or, always within the same digital environment, can solve complex even during the construction issues phase while maintaining the control over the entire process.

All different modules (geometric, economic, energetic, structural, supply, etc.) do work together in this integrated system, leaving to representations the role of descriptors of the overall database complexity, in terms of data and relationships

According to this interaction logic, the traditional, canonical representations based on the two-dimensional simplification of the three-dimensional architectural complexity lose much of their relevance in comparison with digital interactive models, actually more complete and easier to manage using mobile devices (i.e. tablets or smartphones) that are by now commonplace. The representation becomes thus almost exclusively visualization, that is to say a shared standard for meaningfully displaying numerical data and no more an interpretation tool.

BIM AND THE BUILDING (AS BUILT AND HISTORIC ARTIFACT)

Analysing the state of the art of BIM systems, we can easily recognize a wide range of software tools able

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to manage the reality-based information in order to improve the knowledge of any artefact and enhance our control over the building process. The integration of information acquired with different survey methods (Docci, Bianchini & Ippolito, 2011), especially through 3D capturing techniques, into the project database, extends the potential of BIM beyond the design and construction phase to the whole lifecycle of a building. By means of manual or semi-auto tools, the built object can be "disassembled" in its basic geometric components consistent with those defined during the designing phase. According to this approach, the as built is "simply" an updated version of the initial BIM model: for the geometry, as the result of a 3D survey activity, for all other information instead, as the result of the refinements and changes occurred during the construction.

Under this particular light, BIM systems can be conveniently used also for the design of existing buildings. Thus, the real question to ask is how the BIM may represent a real advantage when artifacts are formed more by unique than repeatable elements, that is to say when the diachronic component represents an actual feature to cope with. In order to reach the deep knowledge of the building we have mentioned at the beginning, we should in fact take into account not only the geometric position of each component but also its nature and the cultural/historical context that created it.

While the level of interpretation is minimal for new buildings (due to the great level of detail offered by the industrialization of components) for existing ones it is instead extremely high and actually implies either a considerable discretization process or a simplification of their various features proceeding from the outer skin to the inmost components.

In this second case, the BIM digital model will certainly describe the overall features of the building (geometry, structure, technology, etc.) but renouncing to its deep knowledge that implies, even today, the study of its present shape but also how its basic components have changed over time.

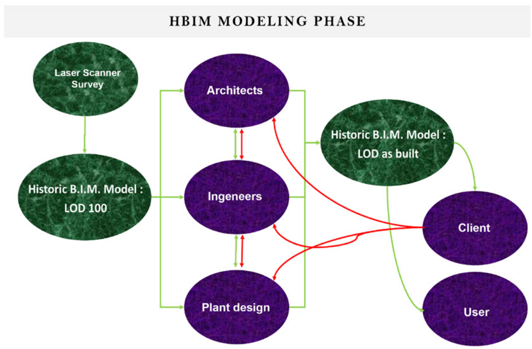
Furthermore, always with a view to simplification related to the idea of standardization, we have to underline how current BIM systems do not allow to set an adequate number of components (at least in comparison with those we can identify in a historic building) unless after a very laborious and time-consuming effort.

An historic building, in fact, often shows a remarkable diversity even in components supposed to be very alike (i.e. architectural orders, decorative elements, windows, etc.) essentially due to their original production chain (individual artisans working separately at the same building).

While, on one side, there is no doubt that the production of architecture (and in particular the management of the entire building process) requires an increasing standardization level to manage its complexities and optimize resources and efforts, on the other we have to point out that this result will not be achieved without tools able to preserve the historic building singularity.

Under this perspective, we could probably distinguish two phases: the former that, following the traditional approach to knowledge, will highlight the components of the object and their qualities; the latter, operational instead, where any new component integrates into the building existing environment respecting its metrics and consistency.

Fig.1 HBIM Process



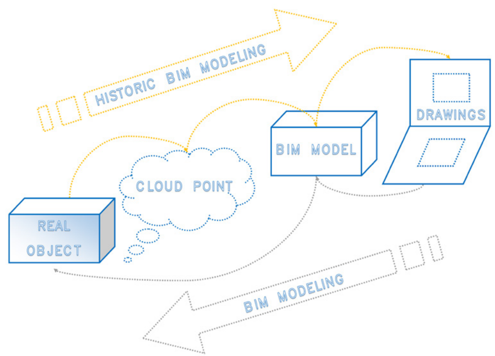
A PROBLEM OF INTEGRATION, THE ROLE OF DRAWING

Knowledge, traditionally represented by graphics of interpretative and selective type, is in fact a key activity for the correct development of the design phase. The designer works using traditional drawing both for investigation designing purposes: on the one hand, through the identification of recurring elements suitable for standardization and on the other highlighting and describing of singularities.

Because of a complexity resistant to standardization, the designer must apply equally complex forms of control of the project. This process actually leads to a tailor-made design, more "expensive" and far less replicable in comparison with that applied to new buildings, but very appropriate. Nevertheless, it is undoubtful that once unveiled the main features of an existing building, its design could follow the conventional workflow used for new ones and, under this perspective, the BIM approach could show its potential in terms of process control, interference detection and virtual representation of a complex reality.

Ortho-images from point clouds, surfaces modelling (polygonal, NURBS, etc.), rendering, prototyping, digital photography and SfM represent by now a standard

Fig.2 BIM process for historic buildings



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in any survey campaign. All these systems can certainly provide a huge number of digital information referred to the object though not at all interpretative.
Apparently, the designer can operate within the digital environment querying very reliable and detailed replicas of the object so to extract information and build a database able to describe the architectural features of the artefact.
Regardless the platform used, an underestimation of the relevance of knowledge for an incisive but respectful design risks to concentrate most efforts on the vane research of recursivities and standards instead of on the deep interpretation of the artefact.
BIM systems, though providing a 3D graphical representation of the project, actually cannot take into account the singularity of architectural components (unless through a huge loss of productivity) and this poor performance actually limit their impact in terms of design quality. The BIM platform is excellent to store, manage and visualize standardized graphic and alphanumerical data, but cannot solve autonomously the problems of knowledge that are fundamental in the design of existing buildings. BIM systems should not be used in place of but in addition to the traditional methodologies of representation and investigation.
We can explain the different approach between knowledge and design, between standardization and singularity, with a little example: let's consider the workflow followed by a designer concerning a single building component to assess its impact on the construction process.
The design of a new building is developed by juxtaposition of standardized elements with fixed features (quality) and position (quantity). During the construction any of these elements is produced according to the design specifications. One of the highest priorities is to reduce as much as possible the interferences between elements so to make the building process smoother and faster. Let's then focus on the element "wall": any digital tool capable to simplify its handling within the project (dimension, position, constraint, performance, etc.) would positively affect not only the management of "walls" but also of all other related elements and systems and, eventually, of the entire process.
This is the typical case in which BIM is a winning choice.
While working on an existing building, instead, even

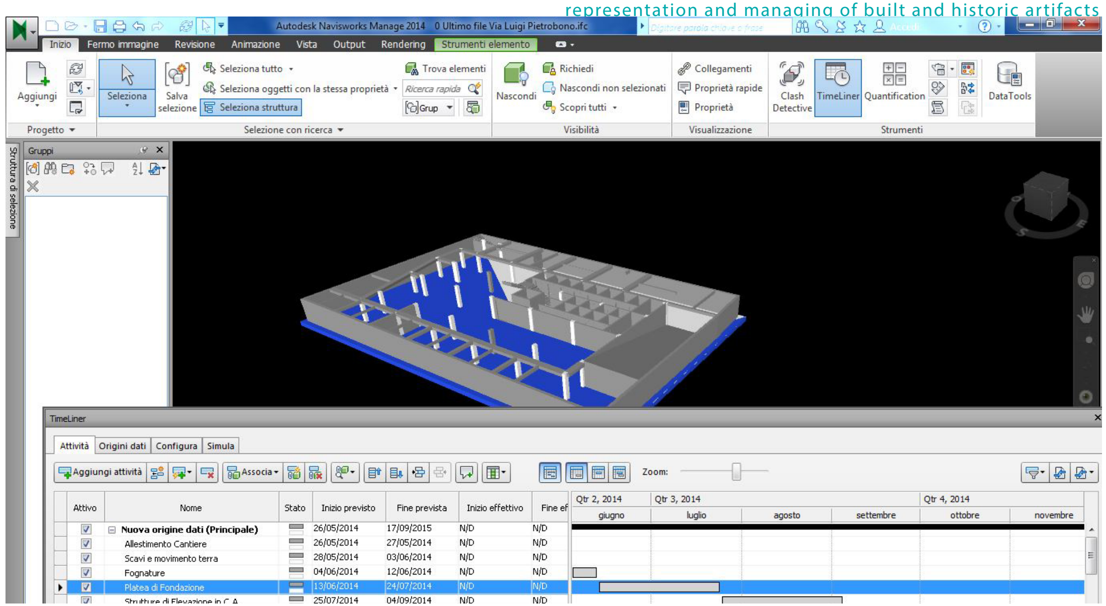

Fig.3 The construction of model (Software: Autodesk Revit, 2015)

the relatively simple element "wall" shows far greater complications in terms of geometric and objectual knowledge because in this case I do not create a new type of wall, I observe and measure (in other words I survey) several different walls each potentially representing a singularity in the same built context.
Data collected on the object according to the invasiveness of the survey (superficial capturing, internal inspection, logging, etc.) will have to merge with a patient and profound study of the element (i.e. stylistic, comparative, statistic, etc.) seeking invariants: the standardization will thus be the result of this process and will respect the constraints in terms of reliability we have just mentioned.

ON THE CONSTRUCTION OF THE IDEAL MODEL

Nowadays, the focus of the representation disciplines addresses not only existing objects but also ideal models.
The representation of ideal models (Bartolomei & Ippolito, 2015) is a key element for the knowledge of historical artifacts. They can in fact provide a sound interpretation of the built object as a result of a process of disassembling/reassembling of its basic components. Each "typical" element of the building, taken down to its geometric features, can be transposed into the digital environment without losing the complexity of the intervention.
In this type of analysis, BIM systems are indeed a winning tool especially because they allow to work through the control and management of standardized elements.
In the case of existing constructions, the representation issues certainly regard the transition from the surveying (capturing, measuring) to the survey (the final interpretation) that presently is almost completely digi-

tal. For instance, the massive 3D acquisition obtained using a laser scanner records for each point various information (metric, geometric, RGB colour, reflectance). New tools implemented within BIM software allow to import this information as part of its general database. Notwithstanding the doubts previously discussed about the very concept of standardization of historic elements and the limitations imposed by their knowability only in terms of superficial geometry, the usage of BIM could be profitable also in the processing of surveyed data. In case of a restoration or renovation project, for instance, where the designer must keep together new and existing elements and the captured information would certainly represent the needed knowledge-base to shape the different activities (functional, structural, materic, chromatic. etc.). In this case the survey, corresponding to the digital transposition of reality, is the most suitable working basis for the architectural intervention and the BIM systems probably the most promising tool for managing all the component of this process.
Standardize and represent such an ideal model is possible only once you have encoded in databases all elements in a sound and consistent way.
The same databases can be used to import a reality-based survey in a BIM environment creating libraries of recurring elements.
One could at his stage propose the following syllogism: survey = deep knowledge, BIM = deep knowledge, then: survey = BIM?
The answer to this question is obviously negative if you simply refer to a reality-based survey. But it is possible to make important remarks in connection with the representation of the ideal model of the building and especially with its construction.
In this case, the survey aims in fact at identifying and cataloguing the different components of the object so to provide a semantic reading of what exists (or does not exist anymore!) and eventually increase the level of knowledge.
An approach based on this standardization of the idea is probably pretty far from professional practices, but it could lead to interesting results in the field of research, of knowledge advancement and also of teaching. In this framework, some topics seem particularly relevant:

- define the different categories of items from a reality-based survey (namely from an unstructured collection of data) and to import objects within a BIM;
- connect the concepts of model and information considering each single item like a large repository;
- combine items/repositories of information in libraries devoted to existing buildings (especially the historical).

Anyway, in the BIM process, the survey step should be regarded as one of the initial rings of the long chain representing the building workflow. From this standpoint, data optimization should not be intended as an output itself, but as the research of the maximum detail importable into the process using an infographic model.

CONCLUSION

The BIM universe will undoubtfully arouse great and diversified interests amongst actors involved in the design/building process but also of scholars dealing with representation disciplines. The BIM systems appear in fact particularly suitable to respond to both needs providing on a single platform analytic tool, visualization interfaces, assessment instruments but also a bundle for the representation of reality. And, in addition to that, always taking into account the management of the process in terms of timing that is a key element for a correct handling of any building workflow.
So far, the only way to handle the different problems connected with the building process passed through its fragmentation into several tasks, each of them separately analyzed and planned using specific means and media (drawings, texts, graphics, technical sheets, etc.). The construction, though, being a process is strictly related to the variable time: time for the building operations, time as a factor that changes the state of objects; time as a key element for the design; time, finally, intended as the building life cycle.
Each issue, in its time, was separated from the others and only the skill and experience of the various actors involved were able to provide answers, never certain and still difficult to schedule.
Today this is no longer possible: partly because of the desire to manage properly the human and economic resources; partly because, as every other economic activity, also architecture is subjected to detailed planning and cannot be left to chance or uncertain.
This idea is not so innovative. Already Vitruvius in the "De Architectura" ascribed the design process to the sole responsibility of the architect who had to respond in person for his project in terms of cost and time used to carry out the work.
2000 years have passed since those words were written and the problem of the construction seems to be the same, with the increased complexity of contemporary means and needs. In fact, to more efficient building technologies correspond exponentially increased performance demands both for new or existing assets. It is no longer thinkable that a single actor can check all the specifications of a complex object; at the same time, the workflow concerning architecture design and construction is far too complex for a single handling, especially when you have to transform drawings into matter.
BIM seems to provide an answer to all this by proposing a new work model: integrated, interactive and able to contain in a single environment single project specifications and the contributions of all stakeholders. A platform that, with a new control on the time component, is used from the beginning of the project to its completion and beyond to the management of the lifecycle of the building. Present complex buildings, made of multi-layered technical systems, advanced technologies and skins, need a proper management and maintenance that cannot be left to chance being instead an increasingly relevant part of the design process.
This is why the interface proposed by BIM systems provides an excellent basis for the necessary interactive cooperation that all actors have to carry out for a successful endeavour.
BIM will probably provide ideal models also for existing buildings so to outline their evolution over time. But this will never replace the intrinsic evidence of built architecture and its permanent and together transitory character in relation with the passing of time.
The inconsistency between reality of an existing object and its modelling for design purposes has always been one of the main causes of delay and cost increase during the construction phase. This evidence obliges to find an intermediate solution at present conflict between BIM simplification and the high resolution detail of 3D massive capturing systems. It is paramount, in fact, that survey (in all senses, traditional, advanced, etc.) has always to be considered as the first ring of the construction chain and, conversely, also of the BIM

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chain this last representing the best available simulation environment for construction.
Also this part of the work is analyzed and planned in a BIM model, generally drafting a BIM Execution Planning (BEP) which encloses tables describing the accountability matrix for the whole workflow. All companies and professionals takes in this way their own direct and precise responsibilities; on the other hand this reference framework clarifies how much is relevant each contribution to avoid delay and additional costs.
The application of the BIM methodology, definitely beneficial to new constructions, can have very positive effects also on projects involving existing objects. The innovative construction chain setup by BIM approach, in fact, creates a new constraint workflow binding all actors (designers, consultants, professionals, commissioners, companies, users, etc.). From this standpoint, the
drawbacks of BIM often are more related to a low acquaintance or a superficial knowledge of the system by actors (or a reluctant attitude to change their habits) instead of an actual inability of systems to process and manage the required information.
Beyond the technical performance and specification of software, it is the change of perspective compared to the past that makes BIM an interesting and probably irreversible process.

NOTE

[1] […] In 2009, it was forecast that the policies and measures in force at European and national level would still leave the EU primary energy consumption at about 1680 Mtoe in 2020. Since then, Member States have committed to energy efficiency as a key element in their energy policies and energy efficiency measures have started to function on a significant scale. It is now projected that primary energy consumption will progressively decrease towards 2020 and 2030. This is encouraging progress but it should be noted that the poor performance of Europe's economy has also added a significant contribution, and that these projections still leave a gap in relation to the EU target for 2020. Moreover, it is clear that more ambitious action on energy efficiency will be needed to achieve EU objectives for 2030. "Horizon 2020 - Work programme, p.15

[2] As made clear – among others – by Descartres himself, this approach distinguishes two different types of cognition: normal, superficial cognition gained solely with our sense organs and profound cognition attained by the student by applying research methods and techniques which can disclose to them mind all that is inaccessible to the to the senses
This cognition, therefore, can be considered to be based on the application of the scientific method. To put it in a nutshell, research is considered scientific (1) if it is conducted with a defined set of techniques, (2) if it is based of the acquisition of observable, empirical and measurable data with the a priori assumed concrete and controlled uncertainty level; (3) if the data can be archived, shared and subjected to independent assessment; if the procedures applies can be replicable in order to acquire a new set of comparable data.

[3] All the above component elements are part and parcel of the cognition process conventionally called SURVEYING.They are all fairly delineated to the degree that the whole process can be articulated into distinct stages with each characterized by a precisely maintained level of scientificity:
• Survey designing (planning) constitutes the most important operation of the whole process; it is at this stage that objectives, priorities and the use of proper instruments at one's disposal come to be defined and selected.
• Data acquisition (surveying) is the stage of actualizing and verifying the whole surveying process; it allows the researcher to construct a simplified database of reality composed of single metric information. To a certain extent it can, too, be considered a scientific operation.
• Representation stage focused on obtaining a coherent and well-scaled version of the reality analyzed;
• The stage of re-reading and interpreting of data extracted at the preceding stages.
• The final stage centered on data communicating.
While the first two stages can (and ought to) follow a rigorous scientific approach, the other ones seem to be the result of a critical activity, depending as they do on the sensibility and interpretative capacity of the person who chooses, selects and represents.

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