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Enrico Cicalò *Editor*

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Enrico Cicalò
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Preface

After the first edition hosted in Brixen by the Free University of Bozen, "IMMAGINI? International and Interdisciplinary Conference Image and Imagination between Representation, Communication Education and Psychology" has become a biennial and itinerant event that in 2019 arrived in Sardinia, in Alghero, hosted by the Department of Architecture, Design and Urban Planning of the University of Sassari. The event has preserved its international and interdisciplinary character, focusing in this new edition on graphic languages, on their being image and on their relationship with the imagination, on their use in the different fields of science and the arts, to explore the emerging fields of research and relevant experiments, the new interdisciplinary applications, highlighting their scientific relevance in relation to both their history and the contemporary context with its peculiarities, problems and potentialities.

Also, this edition of the conference was organized and supported by a network of researchers from different universities and disciplines. The event was sponsored by four Italian scientific societies: UID (Unione Italiana per il Disegno), SID (Società Italiana di Design), SIPED (Società Italiana di Pedagogia), AIP (Associazione Italiana di Psicologia) and AIAP (Associazione Italiana Design della Comunicazione Visiva).

The conference proposed the exploration of the *Graphic Sciences*, a name capable of synthesizing the variety of approaches and traditions with which the disciplines of graphic representation are declined in the international panorama of research and teaching.

The call for papers and for images was answered by 180 authors from 9 countries and 42 universities and research centres. About 70 contributions were presented in Alghero. The responses to the calls declined the proposed keyword in a plural way, outlining six major areas of interest of the hypothesized *Graphic Sciences*:

- graphic thinking and learning
- drawing, geometry and history of representation
- digital modelling, virtual and augmented relay, gaming

– graphic languages, writing and lettering
– graphic communication and digital media
– data and infographic visualization

These areas have made it possible to represent the complexity of genealogy and geography of what have been hypothesized to be the *Graphic Sciences* and that find different names and characterizations in the international research but that are united by their contents belonging to the sphere of production, analysis and interpretation of images in the most varied fields of application. This genealogy and geography of the *Graphic Sciences* has been represented in diagrammatic form through an image that has been used as a map and graphic index of the conference.

The IMG2019 conference was conceived not only as a collection of research presentations, but was itself a research experimentation aimed at verifying a hypothesis—i.e. the definition of a field of knowledge definable as *Graphic Sciences*—through a method—i.e. the collection and analysis of data from call submissions—to achieve a result—i.e. the verification of the possibility of defining and representing the hypothesized *Graphic Sciences* and its different fields of investigation—although not exhaustive and not definitive but that the next editions of IMG events will can deepen and further develop.

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Architectural Language, Between Narration and Architectural Representation

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Abstract. The following article intends to deal with the theme of representation in its various conceptions and types. Starting from a first approach focused on the terms of *narration* and *expression*, we interrogate ourselves about the difference that exists in applying the notion of *graphics* to them. In this way, we introduce the architectural sphere, which is able to express its own language only through graphic representation, thus communicating the idea behind the project. As a consequence, the development and changes sustained over time by the discipline regarding its expressive representations are addressed. Particular attention is given to the metamorphosis and renewal due to the advent of electronics: in fact, digital technology has transformed the vision of space and provided a new modeling methodology, determining a modern concept of graphics. The implications that derive from it are manifested in multiple ways of reading and narrating the architectural project; the current characteristics of objectification and expression in contemporary representations are therefore treated. Finally, there is a space for reflection on the importance of the knowledge of traditional design in approaching the most avant-garde techniques.

Keywords: Graphic expression · Graphic narration

1 Introduction

"Nella mia esperienza la spinta a scrivere è sempre legata alla mancanza di qualcosa che si vorrebbe conoscere e possedere, qualcosa che ci sfugge. E siccome conosco bene questo tipo di spinta, mi sembra di poterla riconoscere anche nei grandi scrittori le cui voci sembrano giungerci dalla cima d'una esperienza assoluta. Quello che essi ci trasmettono è il senso dell'approccio all'esperienza, più che il senso dell'esperienza raggiunta; il loro segreto è il saper conservare intatta la forza del desiderio. In un certo senso, credo che sempre scriviamo di qualcosa che non sappiamo: scriviamo per rendere possibile al mondo non scritto di esprimersi attraverso di noi. Nel momento in cui la mia attenzione si sposta dall'ordine regolare delle righe scritte e segue la mobile complessità che nessuna frase può contenere o esaurire, mi sento vicino a capire che dall'altro lato delle parole c'è qualcosa che cerca d'uscire dal silenzio, di significare attraverso il linguaggio, come battendo colpi su un muro di prigione". (Italo Calvino, "Mondo scritto e mondo non scritto", 1983).

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Narration, from the Latin *narratio*, is the action of describing, exposing and discussing, but it is also the single story fixed in a definitive form (Nuovo Devoto-Oli, the vocabulary of contemporary Italian, 2017, Le Monnier). Thus, the narrative fact can be defined from the pragmatic point of view as a communicative relation for cognitive purposes, and from the strictly structural point of view as the determined succession of more or less premeditated events. With regard to the first meaning attributed to it, narration becomes the indispensable protagonist of the interaction between individuals (transmitter/speaker and auditor), enabling them to acquire a common experience. Instead, if it is conceived in its constructive aspect, it becomes interesting as it imposes the application of its organizational and semiotic abilities in the individual who uses it. Both components together give it an anthropological and syllogistic importance. Starting from the first social groups, the need to know, explain and pass on knowledge from generation to generation has developed. This attitude has developed from its biological nature in step with cultural evolution: religions, for example, have been expressing themselves through towering narratives for thousands of years, responding to the need to decipher the complex variety of elements that characterize our world. At the basis of the narrative act is mainly a sense of group membership: the story is considered a synonym of community tradition and it allows individuals to feel part of their society. In doing so, the descriptive process survives the individual and perpetuates the heritage and intellectual acquisitions of his community, overcoming the transience and the determinateness of human time. The narrative is still a current need: some of its forms have been maintained over the centuries (oral communication, literature, art, theater, etc.), others have been introduced by recent innovations such as cinema or television.

Expression, from the Latin *expressio*, is the act and the way of communicating what one feels, thinks or wants. By extension it is the word or the phrase with which the thought or the feeling is manifested, so it is also the word, locution, lexical unit (Nuovo Devoto-Oli, the vocabulary of contemporary Italian, 2017, Le Monnier). In a more generic sense it becomes a mean of expression, intonation, form, index and sign. Benedetto Croce in his *Estetica*[1] identifies the concept of expression with that of artistic intuition and language, defining the latter for what it was originally, regardless of its contemporary delineation, which in part makes it an exclusive debasement of practical communication purpose. From an empirical point of view, the expression is similar to the eloquent value pertaining to single forms: art naturally, due to the reactions that it provokes, has first an expressive power, rather than a representative one. On the contrary, in a metaphysical sense the idea of expression is interpreted by G. Colli[2] as a complex articulation and representation of the world, and as the mean through which the latter manifests. The forms of stylistic change, together with the processes needed to consider artistic expression objective are also the protagonists of the work of A.

[1] Benedetto Croce (1866–1952) philosopher, historian, politician, literary critic and Italian writer. Within the scope of his aesthetic theory he intended to investigate the profound motivations of artistic inspiration, which he valued as more valid as more consistent with the category of beauty.

[2] Giorgio Colli (1917–1979) philosopher, philologist, historian of philosophy, translator and Italian academic.

Warburg[3], who analyzes them with the help of a variety of languages from the psychological to the aesthetic imagery, from the evolutionary to the anthropological and to the physicist terminology.

If the word *graphic* is added to the previously mentioned *narration* and *expression*, what transformation occurs? We enter in the more specific field, with clear but not clearly definable contours, of graphic communication: a field that has found its greatest development in the contemporary world thanks to the achievements of technical progress, but even earlier, with the diffusion of the photographic image[4].

2 Expression and Graphic Narration in Architecture

"Il realismo intellettuale registra i cambiamenti, mentre il realismo visivo frammenta la continuità dell'azione in una successione di momenti discontinui, eliminando la relazione tra i momenti precedenti o successivi" Baldassarre Bruna[5].

We define *visual realism* as the mechanism that allows the observation and subsequent graphic representation through which every artistic and pictorial current expresses. An example is cubism in its analytic phase[6]: the subject of the artworks is conceived as observed from different points of view and no longer by a single angle, as typically represented with a perspective view. Cubists are interested in an extremely concrete reality and they take distance from traditional representations, considering them incomplete or untrue[7]. They break down the forms in their essential parts and place them side by side on the canvas, experimenting with a language that is totally representative of reality, facing the world with a scientific and analytical attitude. It is a graphical narrative mode that has much in common with the detector technique: the complete architectural design expects in fact the representation of an object framed by different points of view: in plan, in section and in elevation (if we consider only the field of two-dimensionality). Contiguous figures, conceptually similar to what in childhood is returned in a single figure[8], as if the architect and the child share a common goal: to allow the viewer to enter the reproduced image. The complex graphic

[3] Aby Moritz Warburg (1866–1929) German historian and art critic.

[4] See *Storia del design grafico* by Daniele Baroni and Maurizio Vitta published by Longanesi in 2003.

[5] Psychologist, child and adolescent psychotherapist, writer, teacher of pictorial disciplines, general pedagogy and analysis of graphic language at the Academy of Fine Arts in Rome. Reported quote is taken from an article published on "NoiDonne", February 2007.

[6] See *Oltre il Cubismo* by Le Corbusier and Amédée Ozenfant, Publisher Marinotti, series Vita delle forme, 2011 and *Cubismo in architettura* by Genovese P., Publisher Mancosu, series Large pocket-sized architecture, 2010.

[7] Cubism is opposed to Impressionism in enhancing the volume and no longer the color, of which only the gray and brown ranges are used. From this point of view, the chiaroscuro elements are given by light and shadow. In fact, color is seen as an element of disturbance both for the artist and for the spectator, because it is able to distract from the need to investigate reality.

[8] See *The emotions of the reading* of Levorato M.C., Publisher Il Mulino, series: Studies and research, 2000 and *I'll tell you with the figures. Psychology of child drawing*, Pinto G., Publisher Giunti Scuola, GUS series - Universal school joints, 2016.

construction of the adult can therefore be considered at the same level with the child's drawing, if we consider the communicative intention that guides it. The communicative act itself is then a synonym of graphic expression, that is, of figurative manifestation, as well as collective thought and feeling. Looking at history, every expressive facet is indissolubly linked to a specific cultural tradition: black-figure pottery recalls the Hellenistic school, just as the perspective is emblematic of the Renaissance or the axonometry of rationalist architecture (Fig. 1).

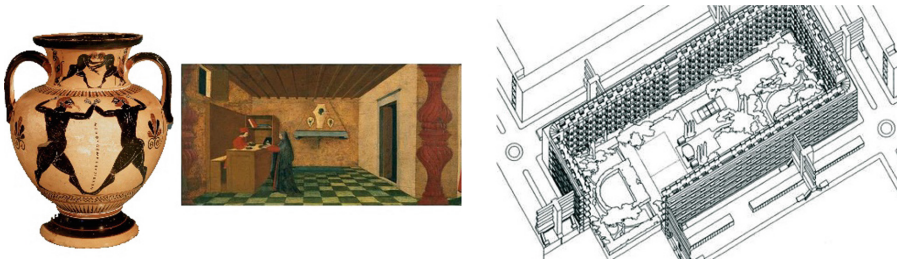

Fig. 1. The image on the left is a classic Hellenic vase reporting a scene of combat. The central image reports *"The Massacre of the Innocents"* by Paolo Uccello, painted following the solemn balance of the central Renaissance perspective. Last, the isometric representation used by the great masters of Rationalism, *Villa Contemporaine di* Le Courbusier and Pierre Janneret.

If we then regard the drawing as an extension of the human mind, it follows that the architectural representation is to be considered as the staging of a space, whether or not it can materialize. It is at the base of the project and of the survey, but it also interposes between them assuming a complex role, even more important in the present world, due to virtual reality. The graphic expression delineates a path *tra l'idea che, attraverso le fasi configurative, diventa architettura e l'architettura costruita che, attraverso percorsi analitici, ritorna al disegno. Tra il progetto che conduce verso la costruzione e il rilievo che dall'esistente ritorna verso il progetto, muovendosi in tragitti spazio-temporali che indirizzano verso il futuro o ricalcano il passato, ripercorrendone a ritroso gli stadi formativi*.[9] The whole system of representation revolves around the moment of conceptualization: later, the various graphic signs take on the role of protagonist, with their ability to express and guide the possible purposes of architectural drawing. The notion of *graphics* encompasses the concept of *visual communication* and accomplishes, in a very short period of time, three fundamental functions: the identification of the object, the direction of the relationship between several objects, in terms of position or scale (cartography or maps, diagrams, tables), the imposition of a message. This last ability, although deviating from the previous ones, is a characteristic of every drawing, whether purposely promotional or not. The author, in writing his idea on paper, impresses his view in his graphic sign, intentionally or unintentionally, like a digital

[9] *La rappresentazione tra progetto e rilievo*, Palestini C., Sacchi L., Mezzetti C., Gangemi Editore spa.

fingerprint that permeates and univocally defines the author's style, from the sheet to the actual building, which becomes immediately recognizable. Therefore, graphical analysis has proved to be an essential educational tool in Faculty of Architecture[10]: it allows in fact to comprehend and interpret the architectural language, through a critical reading of the drawing. The main reference remains the study of past history and buildings, the means of observation and examination accompanied by accurate graphic annotations enabling the drawing to become a mean and a synthesis of ideas and thought.

3 The Experience of Graphic Analysis in the Era of Digital Systems

The analysis of the architectural object consists in the precise examination of the organic elements that compose it. A first functional evaluation, expressed through planimetric concepts, leads the detector to the structural sign and to the balance relation of the parts compared to the whole; the following focus allows the understanding of the architectural organism in its three-dimensionality, in order to comprehend the forms and language from which it is permeated, which are nothing other than the real concretization of its graphical expression. The geometry unveiled by these methods is the DNA of the architectural project, which enables its development from conceptualization to realization, giving the work the intended balance. The experiences of graphical analysis, which conceive the drawing as the undisputed protagonist of the architectural narration, are applicable to any architecture, either ancient or contemporary[11], due to their objective validity. The working methodology remains unchanged over time in its sequence but is constantly updated in the instruments used. Worth of notice are the first developments in computer graphics: in the 1960s, for the first time, the prospect of recreating the whole world with the digital instrument arose, with its aim of realistically simulating the physical space on screen. In particular, in 1969 in America the first computerized architectural experiment began: the architect and university professor Peter Kamnitezer had the merit of ideating the *Cityscape* project, which had the goal of reconstructing a digital city that could be explored by observers. Its graphic is certainly far from the actual one, but extremely realistic compared to the wireframe of the time[12] (Fig. 2).

Following further experiments, computerized images officially opened the way to virtual reality and to the development of sophisticated devices to make it as much as possible comparable to the tangible world. Nowadays, the innovation of the digital architectural representation allows the observer to feel totally inserted into the three-dimensional space virtually modeled. This interactive dimension is currently the most

[10] See the publications of Vincenzo Fasolo at the Institute of History of Architecture of the Faculty of Rome, with the significant title *Analisi grafica dei valori architettonici.*

[11] See the publications of Docci M.

[12] For deepening, see the experiments of Donald Greenberg, which virtually reproduces a truly existing site, and of Negroponte with the MIT Architecture Machine Group, whose ambition was to reproduce an imaginary journey through a city.

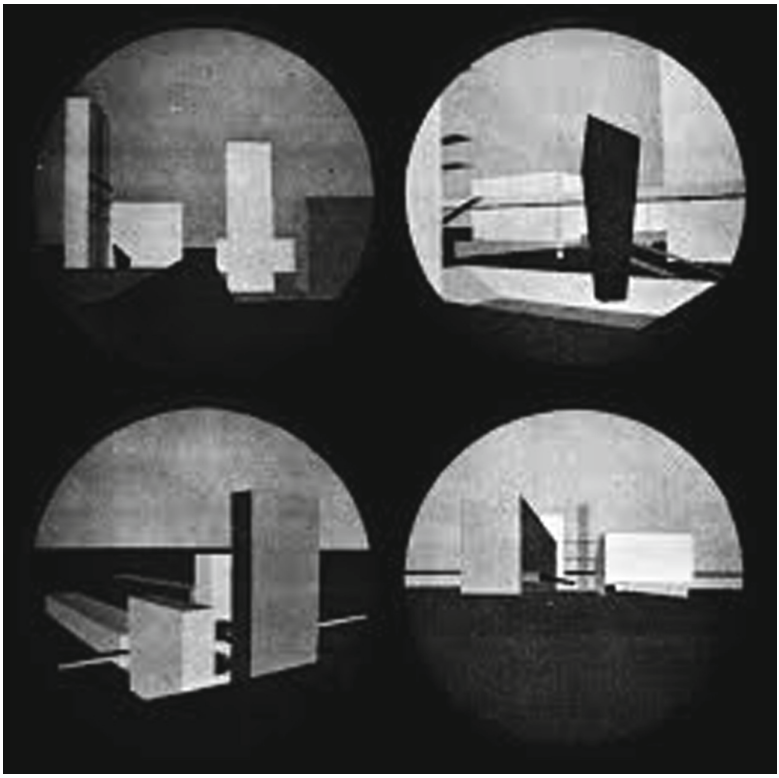

Fig. 2. The image represents four views of the imaginary by Peter Kamnitezer, 1969.

widespread modality in design studies, with significant expressive consequences in the elaboration of images: real multimedia architectural environments are studied. Moreover, technological and conceptual research also leads to the design of exclusively virtual environments, reversing the concept for which the first digital architectural experiments were developed[13]. On the other hand, however, it could also be concluded, from a diminishing point of view, that it is not the concrete and material realization of the project that defines a conceptualized architecture, but rather the computer model itself, which goes from being only an instrument for architecture, to become also the architecture itself[14]. Once again, it is highlighted how the *representation* is the not only an instrument capable of fully defining (and concretizing) the architectural space, but it is the architecture itself (Fig. 3).

It is worth of notice also the facilitation of analytical studies due to the contemporary techniques of digital representation (exemplar is the simultaneous observation of the decomposed object in its different points of view from plan, section and elevation).

[13] See the projects of the virtual environments of Asymptote (Hani Rashid and Lise Anne Couture).

[14] See Kadambari Baxi and Reinhold Martin, who through the virtual dimension, draw attention to the project by considering the informatic model not only as a tool but also as an architecture.

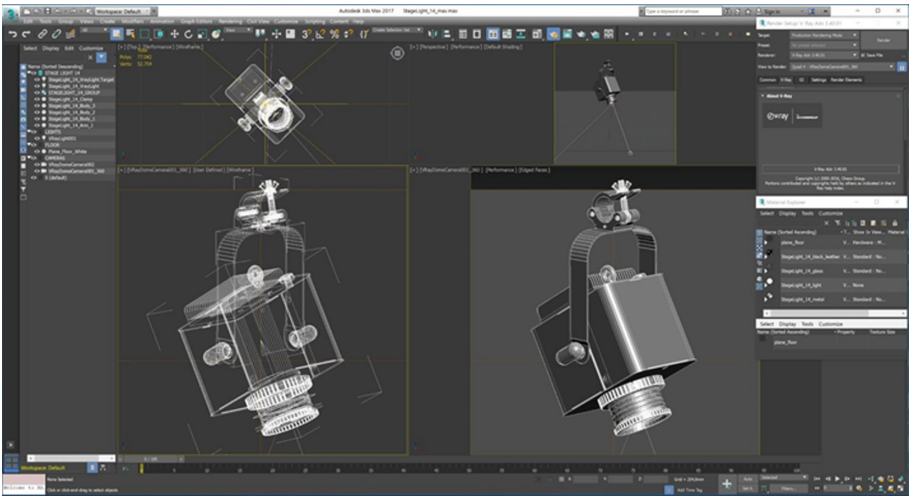

Fig. 3. The image represents a screenshot of a software used for the creation of images and virtual environments.

Consequently, the virtual architecture transforms the traditional notion of space of representation, turning towards a more dynamic conception of form, which inevitably reflects itself on the image produced. The availability of digital techniques and the simultaneous permanence of the manual tools for the design of the project allowed the wide and varied overview of the architectural survey production of these fifty years. The digital graphical instrument, in fact, changes the contemporary scenario by reforming the drawing methodologies, but it is still unable to replace the manual graphic language, which is conversely stimulated by such novelties and proceeds to a complex evolution. Among the others: experiments aimed at the exclusive recovery and revisiting of the past vocabulary and experimentations with the different purpose of a conjunction between traditional and innovative graphic techniques such as drawing and photography. With a brief overview of some significant examples, it must be noted that:

– the first trend focuses on the graphic sign, which is conceived as the primary representative of the values stigmatized in every historical epoch. We study the drawings of great architects of a new classicism, such as Paolo Portoghesi[15], but less traditional forms of expression rooted in contemporary culture are anyway subject of analysis, like the pop style of Robert Venturi[16] (Fig. 4).

[15] Paolo Portoghesi (Rome 1931) architect, academic and architectural theorist, anticipator of the postmodern movement, director of various magazines and art critic.

[16] Robert Venturi (1925–2018), an American architect among the leading exponents of the postmodern current; in his famous manifesto *Complexity and contradictions in architecture* he invites to the search for complex and contradictory elements in works, recognizing in those the vehicle for a universal poetic and expressive sentiment.

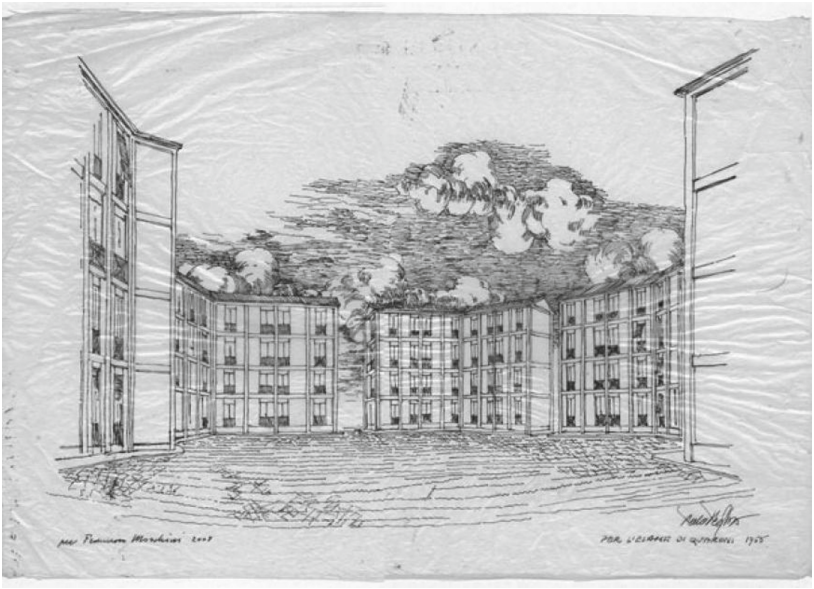

Fig. 4. The image represents the district at Valchetta, Rome (for the examination of Quaroni), 1955 Ink on onion paper, 33 × 48 cm

– the second school of thought sees on the one hand the standardization of modern graphics, whose aesthetic importance must however be recognized (this is the case of Renzo Piano's or Richard N. Rogers's elaborated projects); on the other, the deconstructivist experimentation, which links the collage to the photo-montage, and initiates the explicit mixture of tradition and innovation of the graphic sign[17] (Fig. 5).

During the initial ideological and compositional phase, one of the most appreciated and used instruments was the axonometric method, which allows an immediate understanding of the object through its reproduction on the three Cartesian axes. The axonometric drawing was particularly appreciated, before the advent of digital methods, for the representation of complex experimental projects, that needed a clear reproduction of volumetric relationships. From this point of view, although the perspective image is pleasing to the observer, it is not able to comprehensively describe the architecture. The breakthrough made by the advent of digital instrumentation has reversed the fortunes of these two techniques, attributing to the perspective image the key role of interactive design verification. This change has however proved anything but immediate and for decades (and even now) combinations of manual and digital elaborations have been produced.

[17] See the work of great architects such as Rem Koolhaas (1944) and Zaha Hadid (1950–2016).

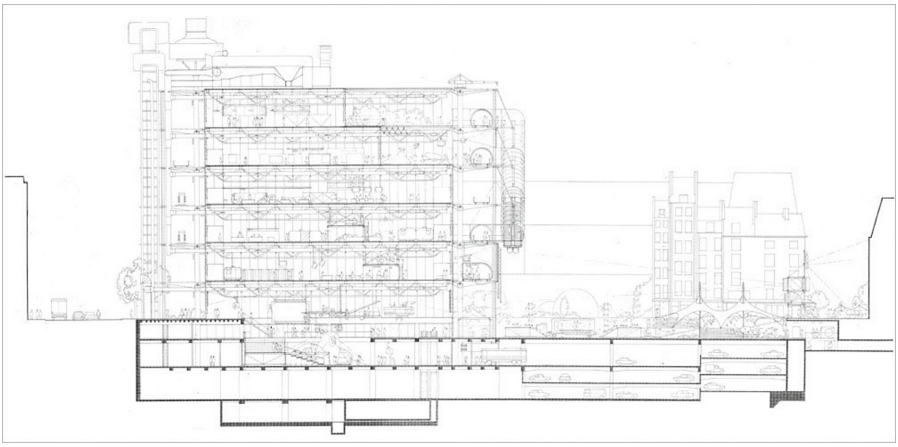

Fig. 5. The image represents a section of the Centre Pompidou (Courtesy Foundation RPBW).

4 Objective Narration and Expressive Graphism in Digital Drawing

Digital design, in its development path, takes on the double meaning of objective narration and expressive graphism: on the one hand, computerization allows a more technical and precise representation, able to enhance the architectural steps and phases; on the other hand, it allows an immediate communication, voluntarily permeated by cultural and artistic reasons. Over the years this has resulted in a codification of the first type, internationally defined, and a generalized freedom of the latter, which finds its limits only in the designer's affection for a certain style. Given the current complexity of the architectural works, the usefulness of the digital is undoubted both for what concerns the quantitative aspect (reduced times for the same productivity), and for the facilitation obtained in the reading of the three-dimensional. There is, however, the risk that in this way the drawing will become a mere controller of the process, if not exclusively a communicator of the results, differently from the traditional procedure, where the lower complexity of the projects allowed the manual representation to lead step by step the realization, from the genesis to the execution of the work. Despite this fact, the necessary modifications on the project are continually repeated on the basis of intermediate controls, which can only be carried out on the image, until the final shape, which no designer is able to fully imagine during the conceptualization phase, is reached. Among the innovative design processes related to digital architecture, some place in the middle as mixtures of traditional tools and avant-garde methods. For example, the modern survey techniques allow the association between the on-site reading and freehand sketch of the place of interest and the consequent transformation of the architectural work into a digital model, through a scan with a laser scanner (Fig. 6).

Fig. 6. The image represents the digital survey by laser scanner of a medieval bridge in Garfagnana, a mountain locality in the province of Lucca in Tuscany.

This tool expresses graphically with a cloud of discrete points illustrating the acquired data, which are subsequently transformed by software into surfaces' figures. The creation of a definitive digital model also allows the rapid creation of the two-dimensional graphics necessary for recovery.

Another technique worth the mention is Structure from motion (SfM). Such methodology consists in range imaging in computer vision and visual perception that allows to obtain three-dimensional structures from bi-dimensional image sequences through the use of movement. The process takes inspiration from the phenomenon for which humans are able to reconstruct 3D structured from the "D projection of a certain object or scene, moving through them.

From the educational point of view, in the Architecture Departments the use of computers by students is generalized as much as superficial. This partly derives from the lack of specific courses and adequate means in the universities and thus from the subsequent self-taught learning process of Italian students. Although many of them achieve outstanding graphical results, the successful use of programs for bi- and three-dimensional creations and modeling is not necessarily connected to the capacity of conducting an architectonic project in its entirety. The aesthetic impact obtained with the representation of a digital model often distracts from the more practical and structural aspects of architecture itself, which leads to a sort of intellectual passivity of tomorrow's professionals.

5 Conclusions

New working methods and new representational needs are necessary for the expression of the formal complexity of contemporary architecture. Digital forms of representation possess the potential of a heightened interaction with the user, which is considered not only the final beneficiary, but also a main actor involved in the designing process. Building Information Modeling (BIM), for example, represents an efficient, albeit still

improvable, software for an optimal structuring of the planning, realization and management of buildings. Thanks to the collection and digital connection of all construction data in a systematic manner, the program helps the operators in the different phases, allowing the visualization of each element as part of a geometric three-dimensional object. In the analysis of already present works, the advantages in the informative management of BIM are limited by the lack of specific documentation or up-to-date and reliable surveys. We then refer to HBIM, Historic Building Information Modelling, that first applies a process of geometrical modelling: the existing architectures must be surveyed through modern and accurate instruments such as laser scanners on land. The result is compared to libraries of software objects, which are then superimposed to the cloud in order to obtain the best affinity to the reality.

Electronics increasingly guide the graphic sign to an aesthetic exaltation, to the point that representation and concept are repeatedly compared in the projects. It seems appropriate then to consider whether it is the digital progress to influence the new architectural signs or the innovative drive of the latter to stimulate the technological evolution in this area. Paraphrasing M. Balzani[18], it seems paradoxical but, parallel to the advent of communication technologies, in all orders and degrees of education, the lesson hours in subjects as drawing, techniques of representation and visual communication have decreased. The new generations *"...possiedono una predilezione per l'innovazione tecnologica generata dalla fusione del display/schermo con un digitalizzatore! L'interfaccia grafica si attiva in uno schermo tattile in cui la rapidità di sfioramento sul vetro di uno smartphone o di un tablet rende completamente diverso quel rapporto fisico che si attiva quando si prova a creare un segno (che poi in fondo è sempre un'incisione) sulla carta e sul cartoncino"* (www.architetti.com). In a world dominated by images, a contradiction is imposed: on the one hand we are witnessing the progression and raising of the level of education, on the other hand a rampant impoverishment in the field of design. It is clear that the situation is not compatible with the architect's profession, which can not be separated from the graphic sign[19]. To the prospect of a fully digital development of the architectural discipline, it seems then necessary to integrate a recovery of the traditional graphic, without opposing it to the former, but rather allowing it to be the foundation of the new expressions of drawing.

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[18] Marcello Balzani, ordinary professor at the Department of Architecture of Ferrara.

[19] For knowledge are reported below the words of Balzani M.: *"Inoltre si è ormai verificato più volte, in diversi gradi e percorsi di apprendimento, che si può diventare dei bravi e competenti rappresentativi digitali se si è passati in qualche modo dall'apprendere e sperimentare il disegno fatto a mano, ovvero dall'aver compreso e rappresentato lo spazio architettonico attraverso un saper fare, che segue alcuni passaggi che sono, inoltre, molto interconnessi con lo sviluppo anche cognitivo della persona."*

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- ***5. Conclusions;***

L'architetto SILVIA LA PLACA è l'autrice dei paragrafi:

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- ***1. Introduction;***
- ***2. Expression and Graphic Narration in Architecture;***
- ***3. The Experience of Graphic Analysis in the Era of Digital Systems***

DICHIARANO CHE IN MERITO AL CONTRIBUTO DAL TITOLO

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Firenze, 25 marzo 2020

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