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Drawing and the Architecture of the New Humanism: Proportion, Representation, and Hybrid Technologies

*By Giulia Pellegri**

The paper examines the role of drawing within the framework of a New Humanism in architecture, arguing that it continues to function as a fundamental epistemic device capable of transforming data, measurements and digital models into interpretative knowledge. Through the integration of proportional analysis, advanced digital surveying, three-dimensional modeling and immersive technologies, drawing assumes a critical mediating role between the complexity of reality and the intelligibility of architectural form. The study demonstrates that neither the metric precision of point clouds nor the generative capacity of artificial intelligence can replace drawing's selective, narrative, and cultural agency. Drawing confers meaning on architectural artefacts by revealing their deep structures, ordering complexity, and establishing hierarchies of relevance. Proportion, regulatory layouts, and interpretive segmentation thus emerge as contemporary tools for reading, representing, and communicating the built heritage. Within this perspective, drawing is not understood as a residual analogue practice but as a hybrid cognitive space in which human sensitivity and algorithmic power converge. It is precisely within this convergence that the New Humanism of architecture takes shape: a humanism that integrates tradition and innovation, analogue and digital processes, measurement and interpretation, reaffirming the central role of drawing as a critical, ethical, and cultural act in contemporary architectural representation.

Keywords: *Architectural Drawing, Proportion, Digital Surveying, Hybrid Representation, Epistemic Drawing.*

Introduction

Within the long humanistic tradition of architecture, the link between drawing, the human body, proportion, landscape and memory is evident. From Egyptian squares to the geometric codifications of the Greek world, from Vitruvian symmetry to Renaissance proportions, architecture has built its own representative order through an inseparable link between measure and meaning[1]. Proportion was not only a technical criterion of composition: it was the language through which a vision of the world was manifested, a way of expressing the harmony between man and the universe. (Vitruvius, 1997; Alberti, 1485; Serlio, 1584). At the root of architectural representation was the idea that the building was a form of knowledge of the world,

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1. Vitruvius "Architecture is an imitation of nature." — *De Architectura*, II, 1. Vitruvius links the project to the understanding of the natural order: knowing the world means knowing how to build. It is the basis of the idea that architectural representation is a form of knowledge of the universe

and that drawing was the instrument that made this knowledge possible.[2]

Modernity has profoundly changed these structures without breaking the thread of tradition. The artistic avant-garde, the Modern Movement, the psychology of perception, the birth of ergonomics, the industrialization of construction processes: all these phenomena have redefined the relationship between the human body and built space, without however canceling the role of measure and proportion as deep structures of form. Le Corbusier's Modulor, for example, testifies to the search for a universal ordering principle based on harmonious relationships and on a rigorous anthropometric reading of the human body. (Le Corbusier, 1955; Wittkower, 1952). Even the season of postmodernism – despite its apparent linguistic fracture – recognized in drawing a fundamental field of critical reflection on the relationship between form, memory and meaning.

Today the challenge is different, more radical and more complex. Digital technologies generate a quantity of data, information and possibilities that risk submerging the architect's interpretative capacity (Carpo, 2017). Digital surveying produces point clouds composed of millions of coordinates, high-resolution models, extremely accurate metric reconstructions but devoid, in themselves, of intentionality (Remondino, 2011). Artificial intelligence, for its part, can generate extremely sophisticated images, simulations of styles, "plausible" formal solutions, but it lacks the experiential, bodily and historical dimension that characterizes the human design process.

In this scenario, drawing returns to being the critical gesture that allows us to transform data into knowledge, technique into culture, model into story (Apollonio et al., 2019). Drawing is the act through which the architect reorders complexity, establishes priorities, hierarchizes phenomena, and gives meaning to the world he represents. It becomes the tool that allows the discipline to maintain a link with its humanistic matrix, while opening up to the potential of digital innovations. Drawing is, today more than ever, a place of resistance and renewal at the same time: resistance to the loss of meaning produced by indiscriminate automation; renewal as the only space in which the synthesis between human sensitivity and algorithmic power is generated.

It is precisely in this synthesis that the New Humanism of architecture takes shape. A humanism different from that of the Renaissance, because it is aware of the ecological, technological and social complexity of the contemporary world. A humanism that does not oppose analog and digital, but integrates them into the framework of a new cognitive ecology. A humanism that sees drawing not as a residue of the past, but as a laboratory of the future: the place where new relationships are built between body and space, between memory and innovation, between measure and complexity, between landscape and design, where cities are considered cultural documents. *Document understood in its broadest literal meaning: any means, especially*

2. Leon Battista Alberti "The line is the visible trace of the concept."— *De Pictura*, I. Alberti affirms that drawing is not a mere technique, but a manifestation of thought: this anticipates the modern definition of drawing as *an instrument of knowledge and design*. Leonardo da Vinci "Painting is a mental thing." — *Treatise on Painting*, par. 22. It is his best-known phrase on the intellectual role of drawing: for Leonardo, representing something means understanding its deep structure. Architecture, like painting, is knowledge of the world through form.

graphics, that proves the existence of a fact, the accuracy or the truth of an assertion and any material object that can be used for the purpose of study, research, consultation, whether in its original state, reproduced or written, work or any other testimony that illustrates and makes known political history, literary, artistic, the ideas, the customs of a people but in ancient times also teaching. The term cultural contemplates the practical adoption of a system of life, a custom, a behavior, or even the attribution of a particular value to certain conceptions or realities, the acquisition of a collective sensitivity and conscience in the face of human and social problems that cannot be ignored or neglected. (Pellegri, 2020).[3]

The paper unfolds through a structured argumentative progression. It first frames the theoretical nexus between drawing, proportion, and architectural representation within both historical tradition and contemporary debate, and then introduces a hybrid methodological framework grounded in the integration of proportional analysis, digital surveying, three-dimensional modeling, and immersive technologies. The discussion of results demonstrates how drawing operates as an epistemic and interpretative device, capable of mediating between data and meaning. In conclusion, the study advances the notion of a New Humanism in architecture, positioning drawing as a critical locus in which human intentionality and digital processes converge, reaffirming its cultural, ethical, and cognitive agency.

Literature Review

The scientific literature on the relationship between drawing, proportion and architectural representation constitutes a vast, stratified and foundational corpus for the entire discipline. Throughout more than two millennia of history, drawing is configured as an epistemic tool that accompanies the evolution of architecture from technical knowledge to speculative art, and finally to a complex cognitive discipline, capable of integrating observation, mathematics, perception and construction of meaning. Understanding this evolution is essential to define the role of design in the context of the New Humanism.

The idea that architectural representation must be based on measurable and harmonious relationships has its roots in the ancient foundations of proportion, canon and cosmology. In ancient Egypt, squares and anthropometric modules were used to ensure iconographic and constructive consistency. Proportion was not only a technical tool, but a symbolic form that expressed the order of the world – a conception that we find in the whole Mediterranean culture (Iversen,1955).

In classical Greece, Pythagorean thought attributes an ontological dimension to number: "things are numbers", the Pythagoreans affirm, indicating mathematics as the structuring principle of reality. The discovery of the golden proportion, exposed in Euclid's Elements, and its application in the arts and architecture, in particular in the Parthenon, express a harmonious conception of the universe based on the

3. G. Pellegri, Di_segni/immagini. Città documento culturale., in Panglossismo, l'Architetto Postpandemico, Pacini Ed., 2020. The contribution is part of a cycle of conferences focused on redefining the role of the architect and reinterpreting the city in the post-pandemic context. It offers a critical reflection on the value of drawing and imagery as tools for reading the city, understood as a complex, stratified, and continuously evolving cultural document.

balance between rationality and sensibility.

Vitruvius, in *De Architectura*, formalizes this tradition, placing the human being at the center of the proportional system. The three components *firmitas*, *utilitas* and *venustas* still represent a fundamental paradigm for understanding the meaning of drawing as a tool for balancing function, technique and aesthetics. Vitruvius also introduces the notion of *commodulatio*, which defines the possibility of relating the parts of a building through proportional relationships obtained from the human body, sanctioning an anthropometric link destined to determine the entire course of the history of architecture.

In the Renaissance, the human body, harmony and the speculative nature of drawing represent a decisive moment in the history of representation. Drawing becomes the method, science, and philosophy of the project. Authors such as Leon Battista Alberti, Filarete[4], (Fig.1) Francesco di Giorgio Martini (Fig.2), Serlio and above all Leonardo define a new cognitive paradigm based on the integration of empirical experience, the study of nature and mathematical rigor.

The idea that the human body is a model of architecture is translated into a series of graphic experiments, famous are the studies of Piero della Francesca, the proportional traces of Francesco di Giorgio Martini (Fig.1) or Leonardo's Vitruvian Man, which explore the correspondence between anatomical measurements and architectural forms. Perspective, codified by Brunelleschi and systematized by Alberti, becomes not only a technique of representation, but a conceptual structure through which to read reality as a geometric order.

It was in the Renaissance that drawing acquired three fundamental dimensions: the cognitive dimension (interpreting reality through geometry), the ideational dimension (generating forms through speculative processes) and the normative dimension (defining rules and proportional relationships).

These three dimensions form the basis of Western culture of representation and continue to influence contemporary digital practices as well.

4. Antonio Averlino known as Filarete, Trattato dell'architettura, ms., sec. XV, membr., 398 x 280 mm (Florence, BNCF, Fondo Nazionale II.I.140)

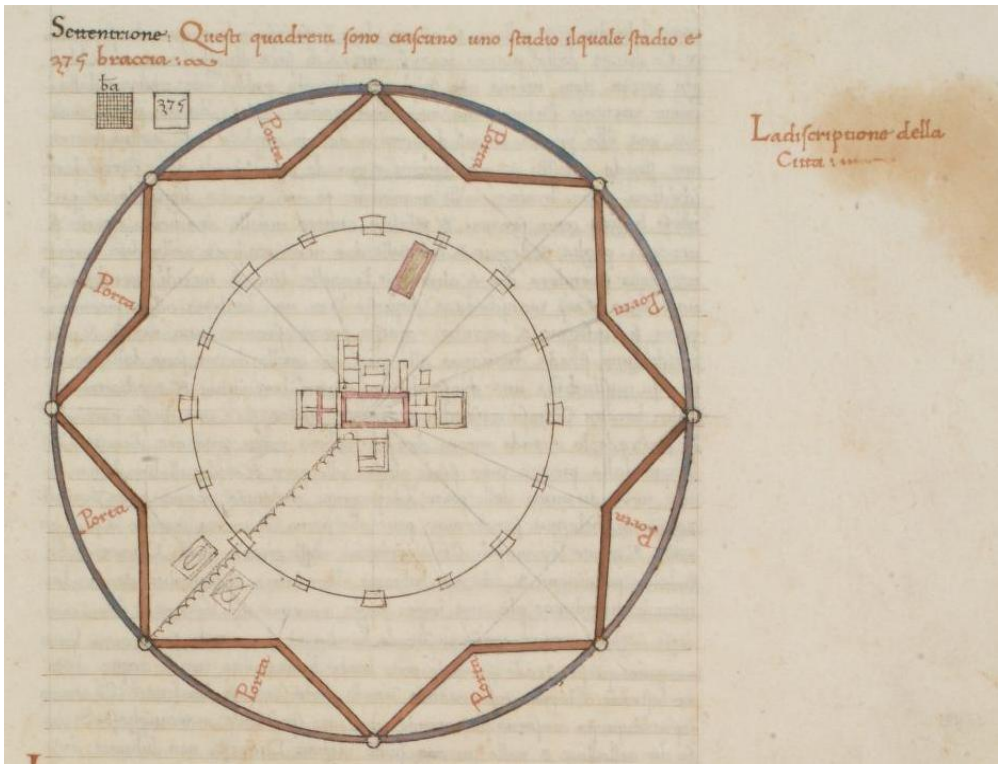

Figure 1. *Antonio Averlino known as Filarete, Map of the Ideal City of Sforzinda, from the Treatise on Architecture (ca. 1460–1464). The Stellar Configuration inscribed in the Circle makes visible the Role of drawing as a Cognitive and Generative Device, Capable of Translating Theoretical, Geometric and Symbolic Principles into Urban Form. The Coexistence of text, Measurements and Graphic Layouts Highlights drawing as a Tool for Mediation between thought, Design and Representation of the Ideal Renaissance City*
Source: Florence, BNCF, Fondo Nazionale II.I.140

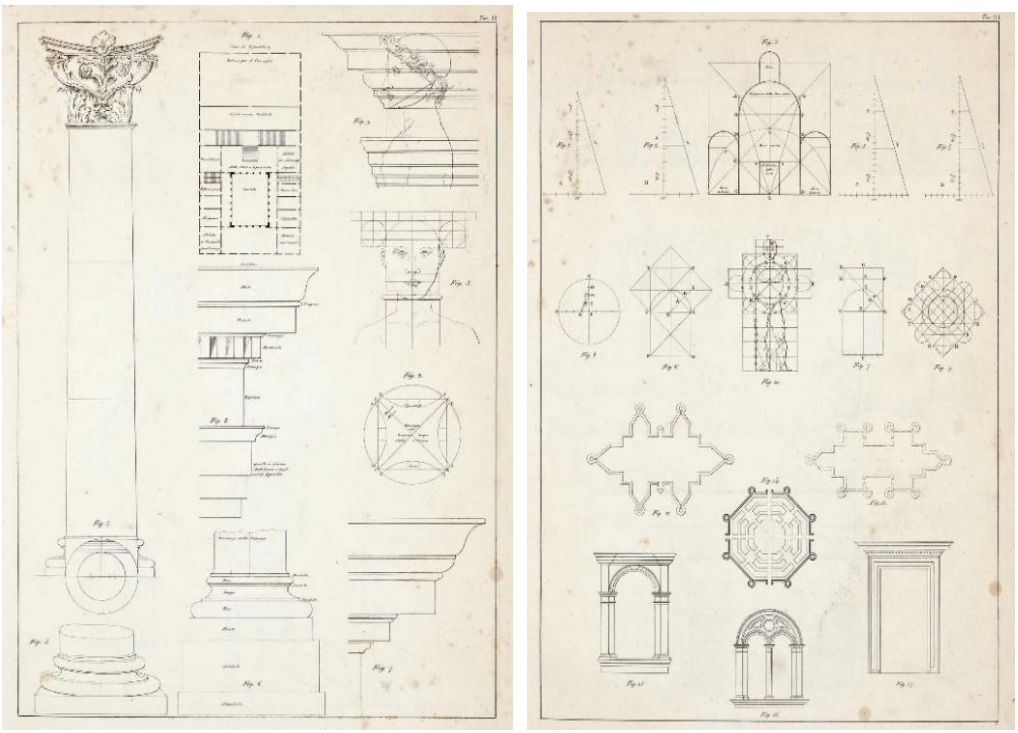

Figure 2. *The Treatise on Architecture, Engineering and Military Art by Francesco di Giorgio Martini. Table.II and Table. III. The Pages Collect Proportional and Constructive Studies of Architectural and Figurative Elements, Columns, Capitals, Profiles, Plans, Arches and Geometric Schemes in which Drawing Operates as a Tool for Analysis, Measurement and Synthesis between Form, Structure and Meaning. The Representation Integrates Geometry, Section, Elevation and Diagram, Configuring the Drawing as a Cognitive and Normative Device, Capable of Translating Theoretical Knowledge into Operational Models for Renaissance Design*
Source: Open Library – Internet Archive

The modern age sees a significant transformation of the relationship between body, space and representation. With the decline of the theocentric model and the affirmation of science, proportion becomes a terrain for rational reflection. Palladio codifies the systematic use of numerical ratios in his *Four Books of Architecture*, translating the geometric and musical harmonies of the classical tradition into a compositional method. At the same time, seventeenth- and eighteenth-century treatises introduced new criteria of proportion based on optical perception, descriptive geometry and visual experience. (Fig.2)

In the twentieth century, theoretical reflection was enriched thanks to the work of Rudolf Wittkower, who reinterpreted Renaissance architecture and highlighted the relationship between proportional canon, symbolism and cosmology. The Modern Movement, far from being anti-classical, seeks new forms of harmony based on functionality and geometric abstraction. Le Corbusier, with the Modulor, (Fig.3) renews the anthropometric tradition by proposing a universal system based on the golden ratio and the Fibonacci series, demonstrating how much the principle of proportion

continues to be considered central to ensuring coherence and legibility to architecture.[5]

At the IX Triennale di Milano, the Bibliographic Exhibition of Studies on Proportions in the Arts and the International Conference dedicated to the same theme were presented, identified by the evocative acronym "De divina proportione", which consciously recalled the Neoplatonic tradition and the famous treatise by Luca Pacioli.

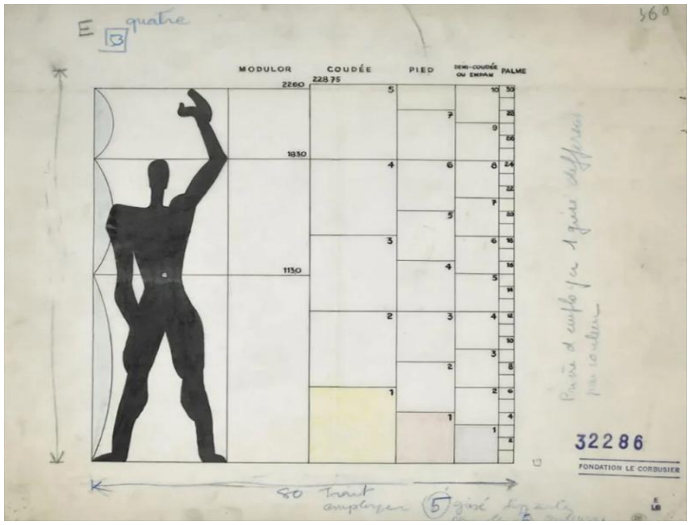

Figure 3. *The Modulor, Le Corbusier, 1945*
Source: Foundation Le Corbusier.

> *Reports and communications have confirmed that the theme of "proportions" is today one of the most lively and passionate aspects of modern criticism. The problem has changed its aspects over the centuries, but the extraordinary fact has been to establish its relevance in our time and to see the usefulness of promoting studies, discussions, polemics in this order of ideas, as the work of the Conference has demonstrated.*
> *In spite of the disparities of tendencies and the different critical positions, it was generally agreed not to leave this Conference as an end in itself, but to consider it the beginning of much wider possibilities for study, and the Committee undertook to satisfy this aspiration for culture with all the greatest good will.*[6]

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5. Le Corbusier. (1954). *The Modulor: A harmonious measure to the human scale universally applicable to architecture and mechanics*. London: Faber and Faber. *From the 26th to the 29th of September, 1951, the Triennale organized the First International Meeting 'De Divina Proportione', attended by scholars, mathematicians, aestheticians, architects and artists from all continents. The 'International Meeting' decided, before it closed, to set up a permanent study group to continue its work and bring it to fruition. The author of this book was chosen to be the chairman of that group. At the same time, the Museum of Modern Art in New York announced by cable its intention of holding the second 'International Meeting on Proportion' in New York. Between the publication of the first edition of the MODULOR and these recent events, there has been a great deal of participation by the readers; many comments, proposals and counter-proposals, criticisms and items of information have been received from all parts of the world in response to our conclusion of the first edition, in Chapter 8: 'Let the user speak next!' We believe this participation of the public to be of very great importance, and, furthermore, we ourselves have applied the MODULOR since 1948 to large-scale works of urbanism, architecture and plastic art in Europe and America. Other technicians, too, have applied the MODULOR in noteworthy ways.*

6. Rudolf Wittkower Atti e Rassegna Tecnica della Società Degli Ingegneri E Degli Architetti

Twentieth-century art – from Cubism to the Bauhaus – further contributes to expanding the meaning of drawing as a tool for the structural expression of movement, perception and spatial rhythm.

The research of Gino Severini, Oskar Schlemmer and Itten shows that drawing is a field of discovery in which the number becomes a gesture, and the gesture becomes a system.

The advent of digital technology introduces profound transformations in the nature of drawing. With the computer, representation is no longer an analogue

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In Torino - Nuova Serie - Year 6 - N. 4 - April 1952 pp.121 "Summary of the conversation: « On some aspects of Proportion in the Middle Ages and in the Renaissance ».

1. The European concept of Proportion was and still is linked to the Pythagorean-Platonic tradition; this tradition, as it is summed up in the "Timaeus" of Plato, has a twofold aspect. It consists of:

a) numerical ratios as expressed in the harmonic intervals of the Greek musical scale (1:2:3:4);
b) of the most completely perfect geometric figures: equilateral triangle, rectangle, isosceles triangle, square and pentagon; figures that make up the elements of the five regular solids.

2. We want to argue in this conversation that the artists and architects of the Middle Ages favored the proportions derived from the foundations of Pythagorean-Platonic geometry, while the Renaissance preferred the numerical aspect, that is, arithmetic (and not geometric) of the tradition. For example: the proportions of Villard de Honnecourt's figures (thirteenth century) are determined by triangles, staves, etc., while Leonardo in his figure studies uses exclusively arithmetical proportions. He compares the proportions of one part of the body to another and establishes purely numerical ratios, such as 1:1, 1:2, 1:3.

3. Why did the geometric aspect of the Pythagorean-Platonic tradition prevail during the Middle Ages, and the arithmetic one during the Renaissance?

Arithmetical proportions, consisting of integral numbers or simple fractions, are commensurable; By contrast, many of the proportions based on Pythagorean-Platonic geometry are immeasurable or irrational. For example, the height of the equilateral triangle is immeasurable with respect to the length of the sides. Irrational proportions would have confronted the Renaissance artist with an insoluble dilemma, since the commensurability of measure is a fundamental point of Renaissance aesthetics. As a result, the golden ratio, an immeasurable proportion, was of little importance during the Renaissance. In contrast to the Renaissance organic numerical approach to proportion, the medieval search for final causes was perfectly satisfied by geometric configurations of a fundamental nature which were however irreconcilable with the organic structure of the figure and construction. The medieval artist projects a pre-established geometric norm in his depictions (Roberto Grosse teste, 1175-1253: "It is by means of lines, angles and geometric figures that all natural phenomena must be understood"), while the Renaissance artist draws the norm from the image (Dürer: "The lines determining a figure cannot be constructed either with the compass or with the ruler", implying with this that they can only be expressed by numerical ratios).

4. a) The same proportions may have a different meaning in different periods; of course, arithmetical proportions were also used during the Middle Ages, but never with a view to an arithmetical integration of the whole. By contrast, the Renaissance artist strives to arithmetically integrate the relationships between the whole and the parts.

b) On the other hand, geometry had an important function during the Renaissance. In both periods the square has a predominant importance; Many medieval artists doubled and halved the area of the basement square without worrying about the fact that the sides of the major or minor square are immeasurable. During the Renaissance this configuration was discarded and the Renaissance mind found perfection in the simple ratios of the sides of the square: 1:1 (unison in music).

5. This examination of a purely historical nature can, I believe, teach us a wise lesson about our problems today. In the age of a non-Euclidean geometry and the fourth dimension, the concept of time and space is necessarily different from that of previous centuries, and there is no shortcut to a new creative approach to proportion.

process but a discrete one: the line becomes a series of points, the colour a matrix of values, the form an algorithm. This step is far from neutral. As Mario Carpo observes, digitization modifies the ontology of the image, producing a "culture of the copy" based on repeatability, variability and parametricity (Carpo, 2017).

Three-dimensional modeling, Building Information Modelling (BIM), algorithmic shape coding, parametric and generative representations redefine the design space and introduce new creative paradigms. However, these tools do not eliminate the drawing: they transform it. The drawing becomes an operational environment, a space of relationship between data, processes and intentions.

At the same time, the digitization of the survey – through techniques such as laser scanning, structure-from-motion, UAV multispectral photogrammetry – makes it possible to acquire reality in a very dense, detailed, almost exhaustive way. The point cloud is configured as a total representation, but its meaning depends entirely on the designer's interpretative ability (Remondino, 2011).

In recent years, a new research front has invested representation: that of immersive technologies. Augmented reality, virtual reality and mixed reality expand the domain of drawing in experiential form: the represented space is no longer only observed from the outside, but explored from the inside. The model becomes the environment, the drawing becomes experience (McQuire, 2008).

The most recent literature shows that the immersive quality of these tools does not replace drawing but expands it, giving the designer new interpretative and narrative possibilities. Architecture, immersed in its representation, becomes an object of active, dynamic, multisensory reading.

Finally, the growing presence of artificial intelligence in the generation of architectural images opens up unprecedented epistemological and ethical questions. Generative algorithms can imitate styles, combine languages, propose infinite formal solutions, but they do not possess the narrative, critical and cultural capacity of human design. Current literature speaks of a "crisis of authorship" that requires new reflections on the responsibility of the designer and on the role of representation as an interpretative act.

In recent years, the role of drawing has been further reframed within the emerging field of “drawing as research”, where representation is no longer considered a mere tool of communication, but a primary epistemic and methodological practice. This perspective has been systematically explored in recent publications such as *Practices of Drawing* (OASE, no. 106, 2022) and *Drawing/Disegno* (STOÀ, no. 02, 2023), which position drawing as a critical field of inquiry capable of producing knowledge through iterative, interpretative and projective processes. Within this framework, drawing operates simultaneously as analytical device, speculative medium and research method, reinforcing its centrality in contemporary architectural discourse.

Methodology/Materials and Methods

The methodology adopted in this study is based on the construction of an integrated framework that combines humanistic tradition, advanced digital tools and critical perspectives related to the role of drawing in contemporary architectural representation. The aim is not only to describe a set of techniques, but to show how drawing operates as a node of convergence between different skills – mathematical, historical, technological, perceptive – and how this convergence makes it possible to interpret and govern the complexity of the built reality. (Fig.4)

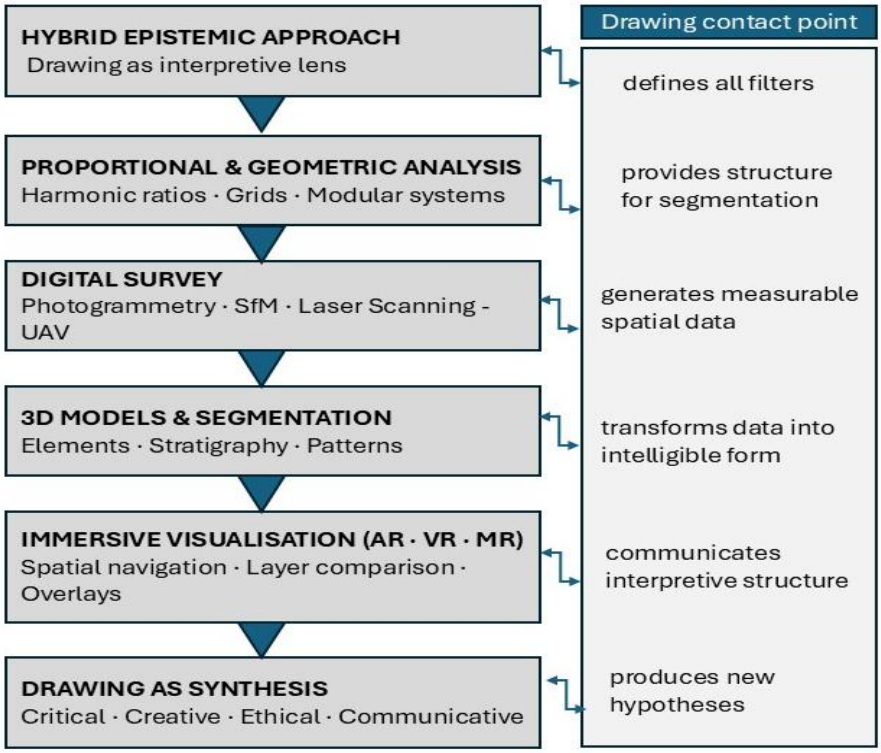

Figure 4. *Scheme of the Methodology of "Drawing as Humanism" in Architecture: Drawing Acts as an Epistemic Device Capable of Guiding the Entire Cognitive Process, from Digital Survey to Interpretative Synthesis. Proportion, Regulatory Layouts and Geometric Structures provide the Humanistic Filter through which to Read, Segment and understand the Built Heritage. The Operational Chain — from Proportional Analysis to Survey, from modeling to Immersive Visualization — Culminates in a Critical and Communicative Design, which does not Limit Itself to describing, but produces new Hypotheses and Design Awareness*
Source: Scheme developed by the author

The fundamental methodological premise consists in recognizing that the drawing is a primary epistemic device through which architecture observes, understands and transforms the world, through a hybrid epistemic approach where drawing is the interpretative lens and acts as: cognitive tool (transforms experience into graphically structured knowledge); training device (exercises criteria for

selection, abstraction, choice of relevant values); interpretative method (offers a critical key to interpreting material and immaterial phenomena); Operational interface (connects design thinking to technical, analogue and digital tools).

The hybrid methodology adopted therefore recognizes in the design the threshold through which both the measured data and their cultural interpretations pass.

The analysis of proportions is one of the central components of the method. It concerns not only the quantitative dimension of the relationships between parts and the building, but also the qualitative dimension through which these relationships are perceived, experienced and signified. The proportional analysis is divided into: reconstruction of grids and regulatory layouts inspired by Renaissance and modern theories; identification of the main harmonic ratios (1:1, 1:2, 2:3, 3:5, 5:8... up to the Fibonacci series); reading of the relationships between heights, widths, depths and spatial sequences; interpretation of modular systems (from the Renaissance square to the Albertian modules, up to the Modulor).

This phase uses both manual tools (freehand drawing, constructed geometries) and digital tools (CAD, vector graphics). The combination makes it possible to compare historical views, subjective perceptions and highly precise data generated by digital surveys (Pellegri, Eriche 2019).

The second methodological component concerns digital surveying considered not as a simple process of technical acquisition, but as an extension of the design in the domain of instrumental measurement. The workflow used integrates:

Photogrammetry and Structure-from-Motion (SfM)

Photogrammetry allows you to reconstruct three-dimensional models starting from from photographic series, using point recognition and correlation algorithms. The SfM method allows: the automatic extraction of homologous points; the generation of high-resolution dense point clouds; the creation of textured meshes and the production of metrically correct orthophotos. It is a process that is highly dependent on the intentionality of the operator: the choice of angles, distances, and photographic overlapping is not neutral but orients the interpretative quality of the resulting model.

Laser scanning 3D

Laser scanning enables the production of three-dimensional models highly accurate through time-of-flight or triangulation measurements.

The result is a georeferenced point cloud; high-density (up to millions of points per room); Uniform and consistent from a metric point of view.

Laser scanning is the most rigorous technology in terms of geometric accuracy in the field of digital surveying. However, even in this case, the datum has no intrinsic meaning: an interpretative process is necessary to transform the cloud into an architectural model endowed with meaning.

Multimodal Data Integration

The methodology adopted does not isolate the data from the different tools, but

integrates them into a unified model (Pellegri & Eriche, 2020).

This model combines: laser scanning geometries; photogrammetry textures; historical information from previous documents and surveys; direct observations made *in situ*; interpretative annotations (reading lines, stratifications, hypothetical reconstructions).

The result is an image of space that does not claim to be objective, but consciously interpreted.

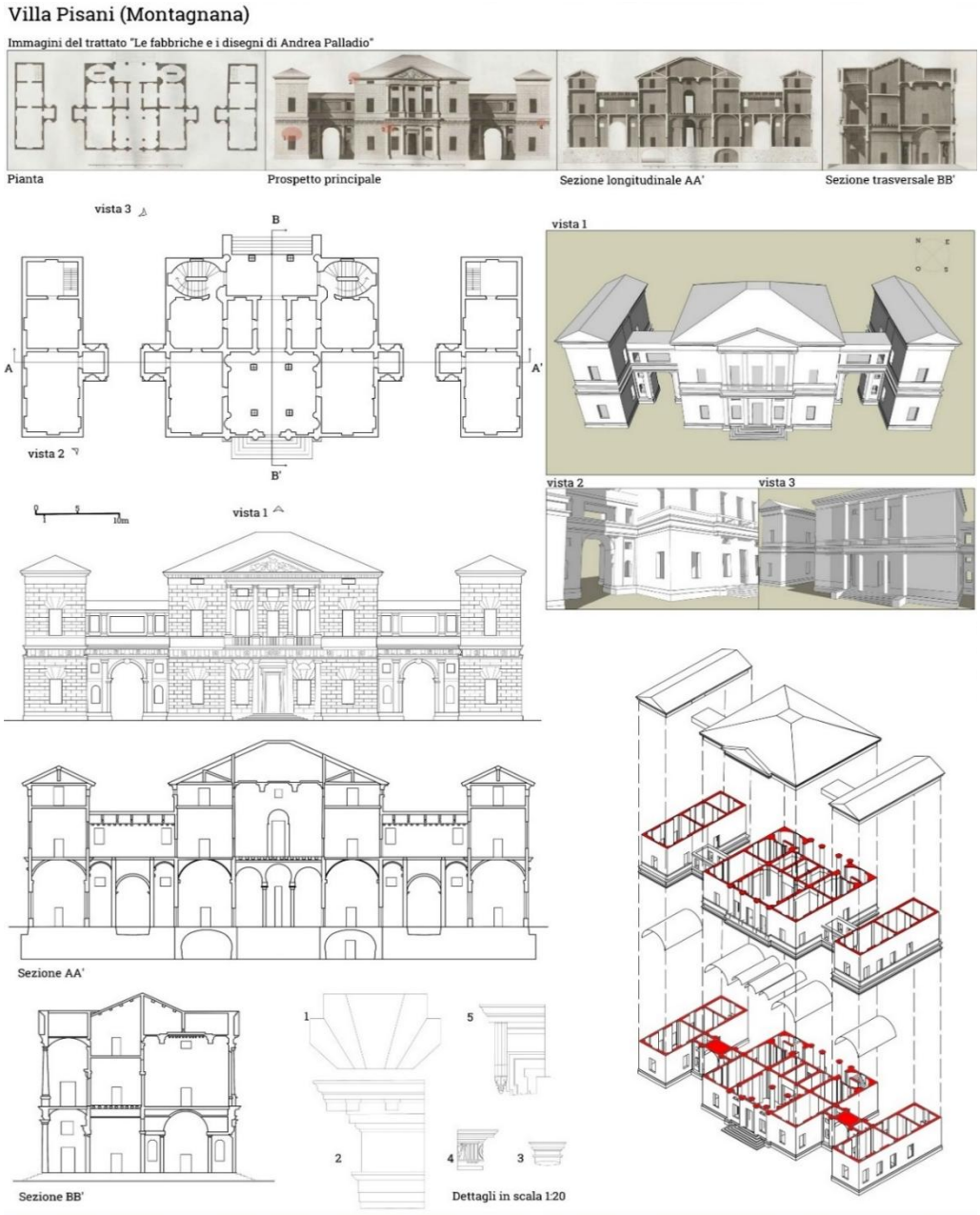

Figure 5. *Architectural Reconstruction of the Villa Pisani in Montagnana, designed by Andrea Palladio but never built, obtained through the Integration of the Original Drawings of the Factories and digital Proportional Analysis*
Source: Results of the Digital Drawing workshop held by the author, University of Genoa.

3D Models, Segmentation, Annotation: Drawing as Interpretation

Once the data has been acquired, the methodology involves a crucial phase: interpretative segmentation. This phase consists of: distinguishing construction elements (planes, walls, cornices, vaults); separate the historical stratifications; identify deformations, lesions, material variations; highlight geometric or proportional patterns. As an exemplary case, the exercise of redrawing and three-dimensional interpretation of Palladian buildings that were never constructed, yet digitally reconstructed, makes explicit the operational potential of the adopted methodology. In these cases, the historical tables have been reinterpreted through Palladian harmonic grids, modules, and regulatory paths, allowing the restoration of the original proportions and the three-dimensional modeling of the architectural layout. The hybrid workflow—from metric verification of sources to 3D modeling, up to the exploded decomposition of structures—highlights how drawing operates as a critical device capable of transforming historical documentation into interpretative knowledge. The reconstruction makes the spatial organization of the building intelligible, reveals the proportional coherence of Palladio's design, and demonstrates the role of drawing as a bridge between historical analysis, geometry, and digital representation. (Fig. 5)

Segmentation is a form of digital design: a critical reworking of data aimed at making it intelligible. Within the 3D model, each line drawn – be it a polyline, an outline, a section – operates as an interpretative gesture that selects and orders information.

Immersive Visualization: AR, VR, and Mixed Reality

The next step in the workflow involves returning data in immersive environments. The goal is not only to visualize, but to increase the understanding of the model through: overlaps between real and digital (AR); three-dimensional first-person (VR) explorations; interactions between digital models and physical space (MR).

Mixed reality, in particular, allows the architectural model to be considered as a dynamic environment in which the user: can observe elements that no longer exist; can manipulate information sections or layers; it can compare different states of an artifact (before/after restoration, reconstruction hypothesis); It can display aspect ratios and adjustment paths intuitively.

This phase demonstrates how digital representation does not replace drawing, but radically expands its operating space, transforming it into a multisensory experience.[7]

The distinctive feature of the methodology adopted is the constant presence of drawing as an interpretative filter. At each stage – from measurement to modeling, from segmentation to immersive visualization – the drawing represents the structure that gives meaning to the data collected. It acts as: a critical act that selects what is relevant; creative act that generates hypotheses and possible scenarios; an ethical act that orients the relationship between technology and culture; communicative act that

7. Eriche S., *Advanced representation in mixed reality: critical/analytical considerations and application experiments*, Phd degree, University og Genoa, 2020.

makes the knowledge produced shareable. (Fig.6)

In this perspective, drawing does not mean decorating or illustrating, but building symbolic, historical and cognitive relationships that allow architecture to produce meaning (Pellegri & Eriche, 2022).

Figure 6. *Comparison of a Dimensioned Plan obtained by Direct Survey (trilateration) and Hyposcopic Plan obtained by Digital Photo-straightening Techniques; Rendered Longitudinal Section and Rendered Longitudinal Cutaway; Three-dimensional Modeling of a Vault of the Side Aisles taking up the Concepts of descriptive geometry projected on the Plane for the Mapping; Digital Model of the Capital via sfm and Render*

Source: Master's thesis in architecture The dimensions of Computer Modeling. From the scale of detail to the territory, from the real to the virtual Case study: the cathedral of Acqui Terme. Supervisor Giulia Pellegri, candidate Domenichelli Sara.

Results

The results that emerged from the application of the methodological framework described in the previous sections highlight how drawing, understood in its broadest and most multidimensional sense, continues to represent the epistemic structure on which architectural knowledge is based in the context of contemporary digital technologies. The evidence collected is divided into four macro-areas: the persistence of drawing as a cognitive device; the interpretative capacity in digital processes; the role of immersive technologies in the mediation between the real and the represented; and the centrality of proportion as a tool for transversal reading.

The first fundamental result concerns the confirmation of the role of drawing as a primary cognitive act. The integration between direct observation, digital survey and analogical representation demonstrates that: drawing continues to be the act of selection through which the architect interprets the complexity of reality; even in the production of digital models, the decisive steps are those of visual recognition, conceptual abstraction, formal synthesis; The drawing maintains a critical function, in the sense that it allows us to establish which elements of the architectural artifact are significant for the construction of knowledge and which, although recorded by sensors, remain devoid of interpretative value.

Digitization has made it clear that measurement is not knowledge; Knowledge is born of interpretation, and interpretation is born of drawing. Digital surveying, despite its impressive density of information, does not automatically produce comprehension: it requires an interpretative posture, a "cognitive direction" that drawing is able to offer.

The second area of results concerns the interpretative role of drawing in the management of digital models. The analysis conducted on different types of three-dimensional models shows that: digital models (point clouds, meshes, surfaces) do not have an intrinsic meaning; their intelligibility depends on selection, segmentation and annotation operations that constitute forms of digital drawing; The critical reading of data requires the definition of information levels, the choice of significant sections, the reconstruction of simplified geometries: all activities that can be traced back to a process of representation filtered by the drawing.

Digital techniques do not reduce the role of drawing, but rather amplify it, making it necessary to: identify geometric patterns hidden in the information noise of point clouds; distinguish structural deformations from significant inconsistencies; reconstruct stratigraphic phases; Synthesize complexity in diagrams, plans, and sections.

In this sense, digitization does not replace drawing, but brings it back to the center, forcing it to evolve as a second-level interpretative act, capable of mediating between an enormous amount of data and structural intelligibility.

A third significant result concerns the way in which immersive technologies (AR, VR, MR) transform the relationship between observer, space and representation. The analysis of case studies and experimental implementations indicates that: augmented and mixed reality allow us to visualize the drawing as an environment, not as a surface; the digital model, inserted in real space, assumes a didactic and communicative function, facilitating the understanding even of non-expert users;

The immersive experience makes geometric and proportional elements that would traditionally require complex analysis immediate.

For example, in heritage contexts: architectural proportions can be made visible through digital overlays; elements that no longer exist can be reconstructed as traversable volumes; historical stratifications can be superimposed on the actual artifact to show evolutionary phases.

These results confirm the idea that immersive technologies do not replace drawing, but transform it into an experiential device, in which representation becomes navigable, manipulable, immersive. The observer is no longer external to the drawing: he enters it, crosses it, interprets it in the first person.

The fourth set of results concerns proportion, which emerges as a unifying element between analogue and digital approaches. The systematic use of grids, numerical ratios, modules and rhythms in the reading of buildings shows that proportion: is still an essential key to understanding architecture, both historical and contemporary; it allows you to identify structuring rules that would escape the mere observation of point clouds; it offers an interpretative framework that effectively dialogues with digital models, highlighting coherences, deviations, deformations and geometric recurrences.

The processing integrates metric data, direct observation and proportional reconstruction, revealing the internal order that structures the composition of the façade: axes of symmetry, modular relationships, geometric recurrences and harmonic devices that are not immediately perceptible. This representation highlights how drawing, understood as an interpretative filter, transforms the measured datum into knowledge, making visible the profound logic of the construction and restoring to the façade its proportional coherence within the historical fabric of the city. (fig.7)

The model combines data from photogrammetry, direct observations and traditional architectural survey, reworked through drawing as a critical filter. The axonometric representation allows you to read geometric continuities, deformations, additions and stratifications typical of the dense fabric of the historic center. The accompanying images – urban location, zenith view and in situ photographs – contextualize the building in the road and volumetric system of the caruggi. The elaboration highlights how the hybrid methodology adopted transforms the measured datum into interpreted knowledge, returning the building as a complex organism in which proportion, matter and urban context contribute to the construction of meaning. (fig.8)

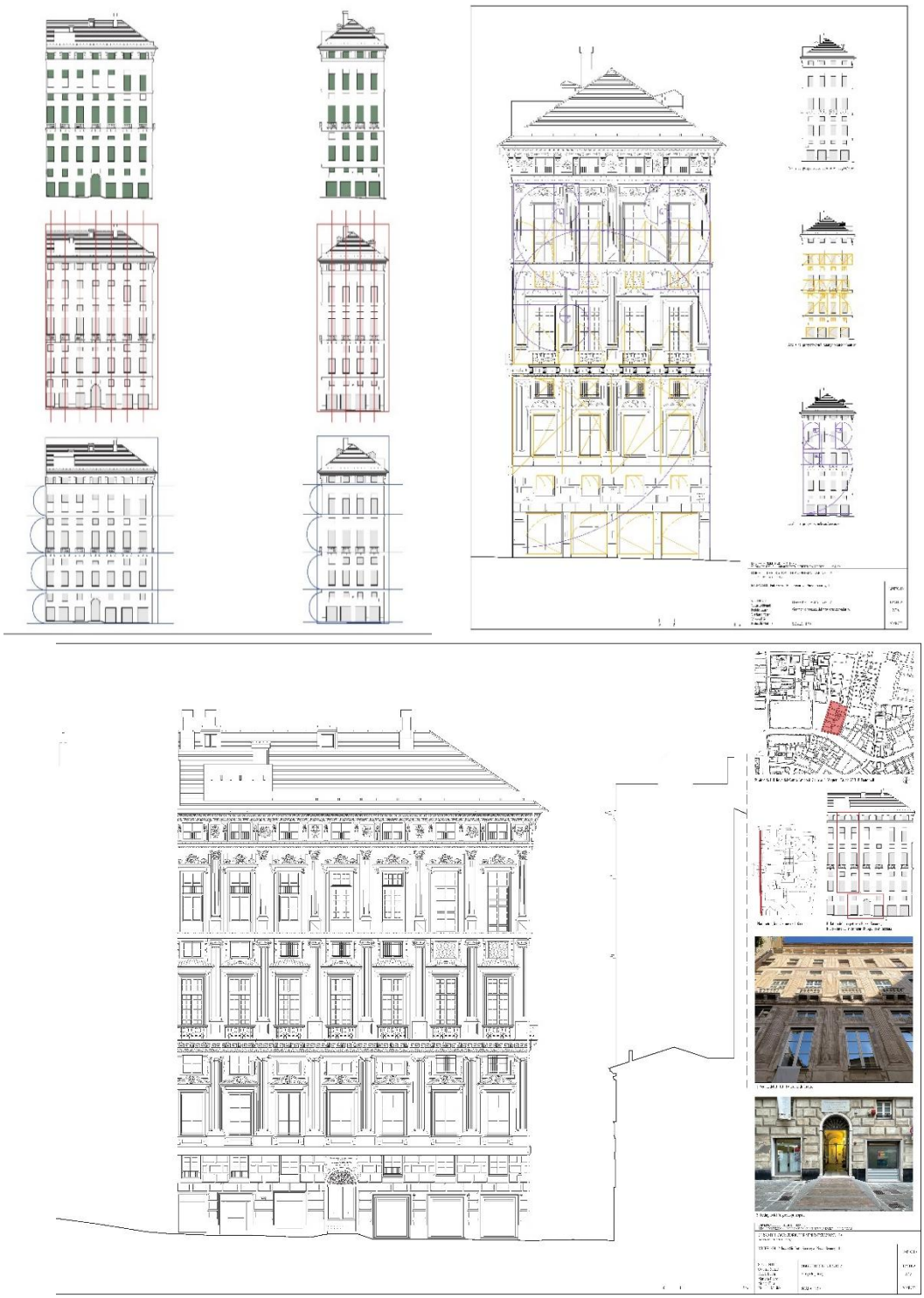

Figure 7. *Analysis of the Hidden Geometries of the Façade of the building in Palazzo Senarega (Genoa), Superimposition of Regulatory Paths, Proportional Grids and Geometric Schemes derived both from the Digital Survey and from the Critical Reading of the Historical Layout*
Source: Results of the Advanced Survey Worksho, G. Pellegri, University of Genoa, 2024.

Figure 8. *Three-dimensional Reconstruction of the Building Overlooking Piazza Senarega (Genoa), obtained by means of an integrated Digital Survey and Subsequent Interpretative Restitution*
Source: Results of the Advanced Survey Workshop, G. Pellegri, University of Genoa, 2024.

A further significant result emerges from the comparison between environmental contexts, historical stratifications and immersive digital models. Research shows that drawing: allows the material, historical, perceptual and environmental dimensions to be integrated into a single representation; it offers effective tools to communicate complex content in a concise and accessible form; it acts as a bridge between past and future, between cultural heritage and innovation, between tradition and experimentation.

The perspective of New Humanism is confirmed by the fact that digital architectural representation is all the more effective the more it is guided by: perceptual sensitivity; knowledge of history; ability to build spatial narratives; awareness of the cultural implications of technology.

The set of results leads to the definition of a model of representation that we can define as human-centric, not in the sense of a naïve return to classical anthropometry, but as a recognition of the irreplaceable role of subjectivity, perception and intentionality in the process of representation.

This model is characterized by: centrality of the interpretative authority of the architect; epistemic continuity between proportional tradition and digital tools; integration between objective data and subjective perceptions; critical space for reflection on artificial intelligence; relevance of the gesture of drawing as a civil and cultural act.

Discussion

The discussion of the results obtained allows us to address some theoretical issues of particular relevance to understand the role of drawing in the current technical and cultural ecosystem. The emergence of a New Humanism in the field of architectural representation does not imply a nostalgic return to the forms of the past, but rather a critical repositioning of the human being at the center of interpretative processes.

This repositioning takes place in a context in which digital is no longer a simple tool, but a real cognitive environment.

The first point that emerged from the research concerns the epistemic nature of drawing as a form of thought. Drawing is not an accessory or illustrative operation: it is a cognitive gesture through which structures, ideas, relationships that are not immediately perceptible in the complexity of reality are made visible. This applies to both traditional and digital drawing.

In the analysis of digital models, the act of drawing sections, diagrams, regulatory paths reveals elements that would otherwise not be interpretable: rhythms, deformations, geometric recurrences, spatial hierarchies. The drawing thus becomes a device that transcends the mere registration of forms to become an interpretation of their meaning. (Pellegri, 2015)

In this perspective, drawing also takes on a critical value: it allows us to question what the datum shows and what it omits, to isolate what is significant and to reject what does not contribute to the construction of knowledge. Drawing does not reproduce: it comments, interprets, judges.

The second point that emerged from the research is the relationship between data and interpretation: a new dialectic. The discussion on the role of drawing is inseparable from the theme of the dialectic between data and interpretation. Digitization produces highly accurate representations, but without intentionality. The point cloud, however precise, remains a set of spatial coordinates that requires a process of selection and interpretation to become architecture.

The drawing therefore intervenes as: data filtering operation;

construction of hierarchies between elements; translation of complex phenomena into readable forms; a negotiation tool between what is measurable and what is perceptible.

In this sense, digital representation does not eliminate subjectivity, but makes it necessary: the excess of information requires a surplus of interpretation. The dialectic between data and meaning intensifies.[8]

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8. 1. UNESCO, *Operational Guidelines for the Implementation of the World Heritage Convention*, 2023, §§141–158: Heritage documentation must be conducted in a scientific and culturally informed manner, avoiding simplified or uncontextualized representations.

2. ICOMOS, *International Charter for the Interpretation and Presentation of Cultural Heritage Sites* (Carta di Ename), 2008: points 2 and 6 require that all mediation, including digital mediation, be guided by intellectual responsibility and methodological transparency.

3. Council of Europe, *Framework Convention on the Value of Cultural Heritage for Society* (Faro Convention), 2005, arts. 4–7: knowledge of heritage requires conscious, not automated, interpretative processes.

The third point takes the form of the crisis of objectivity and the emergence of conscious subjectivity. Trust in digital technologies has often fueled the illusion that it is possible to obtain "objective" representations. However, every step of the process – from the choice of acquisition methods, to post-processing, to data segmentation – is influenced by the operator's interpretative decisions.

The drawing reveals the impossibility of absolute objectivity: every selection is a cultural act; each line is a point of view; every representation is an interpretation of reality.

Subjectivity is not a defect of the representative process, but its constitutive condition. New Humanism does not aim at the elimination of subjectivity, but at its awareness and responsibility.

A fourth point of fundamental current relevance is the relationship between design and artificial intelligence, a comparison that we could define as non-symmetrical. Generative algorithms can produce formally convincing images, simulate styles, and propose compositional variants. However, they operate by statistical correlation, not by interpretation.

Artificial intelligence: recognizes patterns, recombines shapes, generates variations, but does not assign meaning, does not establish values, does not interpret phenomena in their historical, cultural and environmental context.

Drawing, on the contrary: integrates tacit knowledge; incorporates memory and perception; it builds intentionality; formulates judgments and priorities.

The comparison between AI and drawing is not symmetrical: while AI produces images, drawing produces knowledge. Artificial intelligence can amplify, accelerate, support the process, but it cannot replace the interpretative act that is the root of drawing.

The integration between drawing and immersive technologies opens up to a redefinition of representation as an experience. Augmented, virtual and mixed reality do not replace traditional design: they expand its possibilities by transforming it into an environment. In these technologies: the section becomes a space that can be traversed; the diagram becomes a narrative guide; proportion becomes an immersive perceptual structure; the model becomes a habitable scene. (Apollonio et al., 2019)

We thus witness the transition from an observed representation to a lived

4. CEN/TC 346, *EN 17121:2020 – Conservation of Cultural Heritage: Principles for the Use of 3D Modelling*: 3D modeling is declared an interpretative activity, which requires documentation of choices and distinction between measured data and inferred contents.

5. European Commission, *Recommendation 2011/711/EU on the Digitisation and Online Accessibility of Cultural Heritage*: digitisation must preserve cultural values and involve non-automatic interpretative processes.

6. UNESCO, *Recommendation on the Ethics of Artificial Intelligence*, 2021: principles of human supervision, cultural contextualization and rejection of automatisms that distort identities and values.

7. ICOMOS, *Principles for the Application of Artificial Intelligence to Cultural Heritage*, 2023: AI cannot replace human judgment in the interpretative and representative phases of heritage.

8. M. Carpo, *The Second Digital Turn: Design Beyond Intelligence*, MIT Press, 2017: digital systems produce data without intrinsic meaning; interpretation remains the prerogative of the human operator.

9. A. Pérez-Gómez, *Architectural Representation and the Perspective Hinge*, MIT Press, 2000: every representation is a cultural and epistemic act, not reducible to a technical procedure.

representation. This change does not weaken the centrality of drawing, but strengthens it: only drawing, in its interpretative value, can guarantee that the immersive experience does not become pure spectacularization, but a form of knowledge.

Another important point concerns proportion and geometric rhythms as tools of intelligibility, as a cognitive matrix. The analyses conducted show how proportions, regulatory paths and harmonic relationships emerge even – and perhaps especially – when superimposed on digital models. The proportion allows: a transversal reading between geometric, material and cultural dimensions; an immediate comparison between different construction phases; a critical verification of digital interpretations; an interpretation of form as a rhythmic structure of the built. Number thus becomes a form of thought, a way to recognize continuities and ruptures, to understand the internal logic of architecture.

The set of reflections presented leads to outline a new paradigm which we can define as Human-Centered Digital Representation.

This paradigm does not reject technology, but orients it; it does not exclude digital precision, but integrates it into the interpretative complexity of the drawing. The resulting model has four main characteristics: the centrality of design intention, i.e. technology supports, but does not guide thought: it is the design that defines directions, values, priorities; the continuity between tradition and innovation, i.e. proportion, is not the legacy of the past, but finds new applications thanks to digital tools; the recognition of the stratified nature of reality, i.e. drawing, makes it possible to integrate materials, phenomena, stories, perceptions into a single representation, and finally ethical responsibility in the use of technologies where every representative choice is a cultural act: digital must be used consciously, not as an automatism.

Conclusion

The levels of content of the drawing are numerous but I would like to limit myself to talking only about the first three. The first is the direct referential content which consists of what the drawing represents, namely a house, a bridge, a church. Of course, for most people who look at an architecture board, it is almost the most important meaning.

The second is the metaphorical content, a semantic framework through which drawing expresses a judgment on central aspects of existence, on what is valid or what is not, on the question of whether order or chaos is more valuable, whether a compact form or a dispersed form is preferable, whether, on the other hand, it is better to choose a definitive and timeless form or to give a project a processual form that recalls the variety of functions and the action of the context on the constitution and living of the building. Finally, there is the third level of sense, which I like to call the autonomous content of a drawing. Beyond what the drawing indicates, beyond its structurally relating a series of meanings, the drawing itself is proposed as an autonomous work, a real work of art that is recognized exclusively for its formal values. (Purini, 2019)

The analysis articulated in the previous chapters allows us to outline a clear and

complex picture of the role of drawing within the transition towards a New Humanism of architecture. The amount of information, metric data, images, and models generated by contemporary digital technologies has created a representative ecosystem that is as rich as it is potentially disorienting. In the context of this information abundance, drawing emerges not as a residue of the past, but as a critical device capable of governing and giving meaning to complexity. The main evidence that emerges from this research is that drawing is not a technique, but a form of thought. It allows you to: select what is significant; build relationships between dispersed elements; to make the complex intelligible; to attribute a sense to form and space; generate new reading and design hypotheses.

One of the most relevant aspects that emerged from the application of the hybrid methodology, which combines digital surveying, proportional analysis and immersive technologies, concerns the relationship between data and interpretation.

Digital technologies provide detailed but uninterpreted representations: the point cloud is an archive of coordinates, not a meaningful image of a building. Drawing is the means through which these immense amounts of information are filtered, ordered, made comprehensible, transformed into coherent narratives.

In this sense, drawing is inherently critical: it produces meaning through choice and subtraction, through abstraction and synthesis.

The proportional analysis, conducted both with traditional tools and through the digital superimposition of regulatory paths on 3D models, highlighted the strength and relevance of proportional systems. Far from being an outdated legacy, proportion proves to be: a universal cognitive matrix, a structure that crosses eras, styles and technologies, a language that allows us to recognize geometric and cultural coherences, a bridge between human perception and digital measurement.

Proportion, therefore, is not just a historical legacy: it is a contemporary tool, essential for interpreting and communicating architecture in the digital age. The integration between drawing and immersive technologies – augmented, virtual and mixed reality – demonstrates that representation is no longer just a two-dimensional surface, but can become a three-dimensional space that can be navigated, manipulated and traversed.

These technologies: transform the section into an environment; they make proportion an intuitively perceptible structure; they highlight geometric relationships through dynamic overlays; they allow you to visualize elements that no longer exist or only hypothesize; they improve communication with non-specialist users.

The representation thus becomes an active experience, no longer a simple observation. But this experience remains worthless without the interpretative guidance of drawing.

The massive entry of AI into architectural image generation poses complex questions about the role of the author. The analysis conducted shows that: AI can imitate shapes, but cannot attribute meaning; it generates images, but does not produce knowledge; it recombines data, but does not construct interpretations; it proposes solutions, but does not make judgments.

Drawing – human, analogical, intentional – remains the place where the architect's critical responsibility is exercised. Without this filter, the risk is that generative models will replace the capacity for discernment, reducing the project to an exercise in

statistical interpolation.

The overall results of the research suggest that New Humanism does not consist in a naïve return to analog, but in a vision in which: analog and digital coexist in a complementary way; the drawing acts as an interface between measure and imagination; the proportion reconstructs continuity between history and technology; and immersive technologies expand the field of the representable; The designer exercises ethical and interpretative control of the processes.

Drawing thus becomes the place of encounter between memory and innovation. It condenses aesthetic sensitivity, analytical rigor, cultural responsibility and the ability to build narratives that restore meaning to space.[9]

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9. This text was translated with the support of artificial intelligence software and subsequently revised and validated by the author.

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