‘Abstract Machine’. Diagrams in Project Narrative

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Abstract

In the successful relationship between architecture and communication, between project and narrative, between construction and image, the diagram certainly occupies an important position.
In the contemporary design practice’s shift towards prefiguring broad, open, deferrable, indeterminate and perfectible scenarios, the diagram’s effectiveness seems to lie precisely in its ability to transfer complex systems, phenomena and concepts in an immediate and complete way. This mainly graphic form of schematisation seems to configure itself as the most suitable tool for gathering the tensions of a time that is beginning to distance itself from formal perfection and authorial needs in order to slide from the architectural object to the design process.
The diagram is thus simplified, through a schematic didactic organisation: if it can prefigure the form of an architecture, describe its function and/or uses, the relationship between its parts, highlight a theme, an idea, a concept, here we are interested in highlighting its usefulness in the narrative construction of the design process, even ex post. The contribution therefore intends to propose a didactic ‘deconstruction’ of the diagram, with an inevitable simplification and reduction of its rich complexity, justified by the desire to propose not so much a definition of what the diagram is, but rather how it can be used.

Keywords: diagram, process, narrative.

Introduction

“We live in an unending rainfall of images. The most powerful media transform the world into images and multiply it by means of the phantasmagoric play of mirrors. These are images stripped of the inner inevitability that ought to mark every image as form and as meaning, as a claim on the attention and as a source of possible meaning. Much of this could of visual images fades at once, like the dreams that leave no trace in the memory, but what does not fade is a feeling of alienation and discomfort. But maybe this lack of substance is not to be found in images or in language alone, but in the world itself” [Calvino 1988, p. 57]
The world 15 years before the turn of the millennium appeared to Calvino sick with a kind of plague of language that manifested itself as ‘automatism’. This form of disease tended to level expression on the most generic, anonymous and abstract formulas, tended to dilute meanings, to blunt expressive points, giving rise to an epidemic that had infected even the image. And that was 1985.
Today, more than ever, we live among images, we live by images, we produce images. And this is a fact about which the writer does not want to produce some critic or theory. And even if the increasingly widespread proliferation of images brings with it a sort of flattening of content to the ‘surface’, aestheticising a visual communication that loses its meaning, the value of the image in architecture and in the autobiographical

memory of the architect (and of his imagination) is, still, unquestionable.
The contribution therefore does not deal with the issue in general terms but tries to leave a trace of a reflection constructed from an interesting teaching experience, namely the seminars organised at the Department of Architecture of the University of Naples Federico II, *The tale of the project* a.y. 2017-2018 and a.y. 2018-2019, *Telling architectural projects: texts/concepts/diagrams/processes/collages/montages* a.y. 2020/21.
The story of the project, which has little or nothing to do with Gregotti's [better known] *Tale of the Project* (2014), actually grew out of an apparently banal objective: to teach first-year students how to (rap)present a project. It was a sort of 'technical assistance' to those who knew almost nothing about programmes, tools and techniques of representation, with the peculiarity of being offered by someone doing research in a different scientific disciplinary field, that of ICAR/14 Architectural and Urban Composition. In the same months in which this course was trying to build itself up as an opportunity richer than just technical assistance, Roberta Amirante published *The Project as a Research Product* in which she outlined, through abduction, a way of approaching project evaluation by emphasising its narration rather than its production. This narrative "simple, natural, easy and inexpensive to verify" could be capable of reconstructing, even in a verisimilitude, not necessarily true, the almost never logical-deductive or linear path of design thinking [Amirante 2019, pp. 74, 75].
In the direction indicated by Amirante and with the ambition of teaching students how to explain the project, break down the process, point out the materials and techniques used, make sense of an external prescription, conceptualise certain passages, formalise certain choices, show coherence or controlled incoherence, within the courses the use of the diagram was experimented with to make explicit the relationship with the reference, the context, the theme, the design idea and the elements of the architectural composition, in the search for a production of meaningful images.

Diagram, operating instructions

To the diagram [from the Latin *diagramma*, gr. διάγραμμα 'drawing', der. of διαγράφω 'to draw', comp. of διά 'through' and γράφω 'to write'], in 2006 the magazine *Lotus International* dedicated its entire issue *127* - with a remarkably interesting essay by Giovanni Corbellini from which this contribution borrows many words, including the title itself [Corbellini 2006, pp. 89-95]. In the shift in contemporary design practice towards prefiguring broad, open, deferrable, indeterminate and perfectible scenarios, the diagram's effectiveness seems to lie precisely in its ability to transfer complex systems, phenomena and concepts in an immediate and exhaustive way. A reductive and at the same time proliferative machine, abstract and open [Corbellini 2015, p. 47] with a universal degree of communication that is a representation of conceptual models and ideas, a synthetic description of functions, relations, forms, structures, programmes. Going beyond the traditional systems of representation of projective geometry, bound to a strict adherence to objective reality, even if selected, reduced and simplified, the diagram absorbs multiple and interscalar expressions of thought and takes on symbolic values. The diagram represents a visualisation expedient that can condense data, information, processes and forms, condensing logical, functional, structural, computational and compositional relations. The great value of the diagram lies precisely in its interdisciplinarity, in its ability to combine the interrelation between different and distant planes, to connect different fields of knowledge. This form of schematisation, predominantly graphic but with interesting hybridisations or textual substitutions, seems to be the most suitable tool for capturing the tensions of an increasingly liquid and dynamic time, which is beginning to distance itself from formal completeness and authorial requirements to slide from the architectural object to the design process.
The use of the diagram runs through the interests of architectural culture from the utopian representations of the late 18th century (think of Bentham's *Panopticon*), through Christopher Alexander, Herdeg Klaus, Lawrence Halprin, Kevin Lynch, Colin Rowe, learning from Las Vegas with Robert Venturi, from New York with deconstructivist architecture, from Paris with Tschumi and Koolhaas, assimilating the contributions of *Oase, Any 23, A+U* and the positions of Stan Allen, Peter Eisenman and Anthony Vidler. Here, as in the courses, it is simplified through a schematic didactic organisation, to be used 'instrumentally' as a 'piece of narrative'.

So if a diagram can prefigure the form of an architecture, describe its function and/or uses, the relationship between its parts, highlight a theme, an idea, a concept, here we are interested in highlighting its usefulness in the narrative construction of the design process. We therefore propose a didactic 'dismantling' of the diagram, with an inevitable simplification and reduction of its rich complexity, justified by the desire to propose not so much a definition of what the diagram is, but rather how it can be used.

Diagram: analytical/generative tool

The first distinction proposed to use diagrams in the construction of a narrative is that between an analytical and a generative tool. The first device, of the knowing type, is configured to trace the interpretation and systemisation of information from/about reality; the diagram in this case represents the antecedent, that is, the set of facts preceding the one being discussed. The second is traced as the incipit of the narrative to represent the strictly planning genesis. The distance between these two macro-categories tends to reduce to the point of disappearing in many cases in which the interpretation of the data is already oriented by a design vision and, in the same way, when the more or less figurative projection of the project clearly preserves the interpretation of the starting assumptions.
A significant example of the transitory difference between the two categories can be intercepted in Kevin Lynch's *The Image of the City*. The text, published in the States in the early 1960s, materialises the author's efforts at conceptual elaboration on the meaning of places. Lynch's attempt is to construct a common language to decode the historical, social, cultural, political and even religious context in which American society lives. On the basis of a public image of the urban structure, i.e. the mental picture common to layers of the population of a single physical reality, Lynch uses a diagrammatic representation to describe the visual form of the central areas of three American cities through five types of elements: routes, margins, neighbourhoods, nodes and references. On the part of the central peninsula bordered by Massachusetts Avenue chosen as a case study for Boston, the author first constructs *The visual form of Boston as perceived in the survey*, a diagram

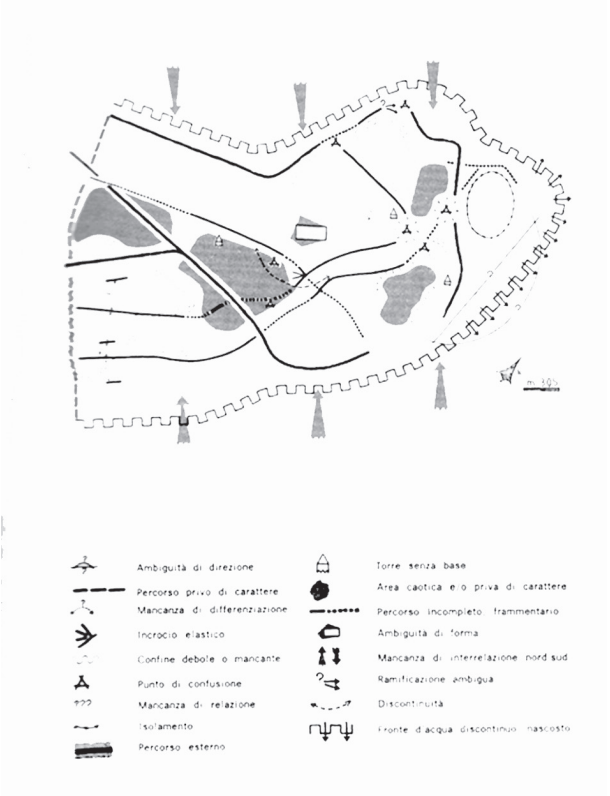
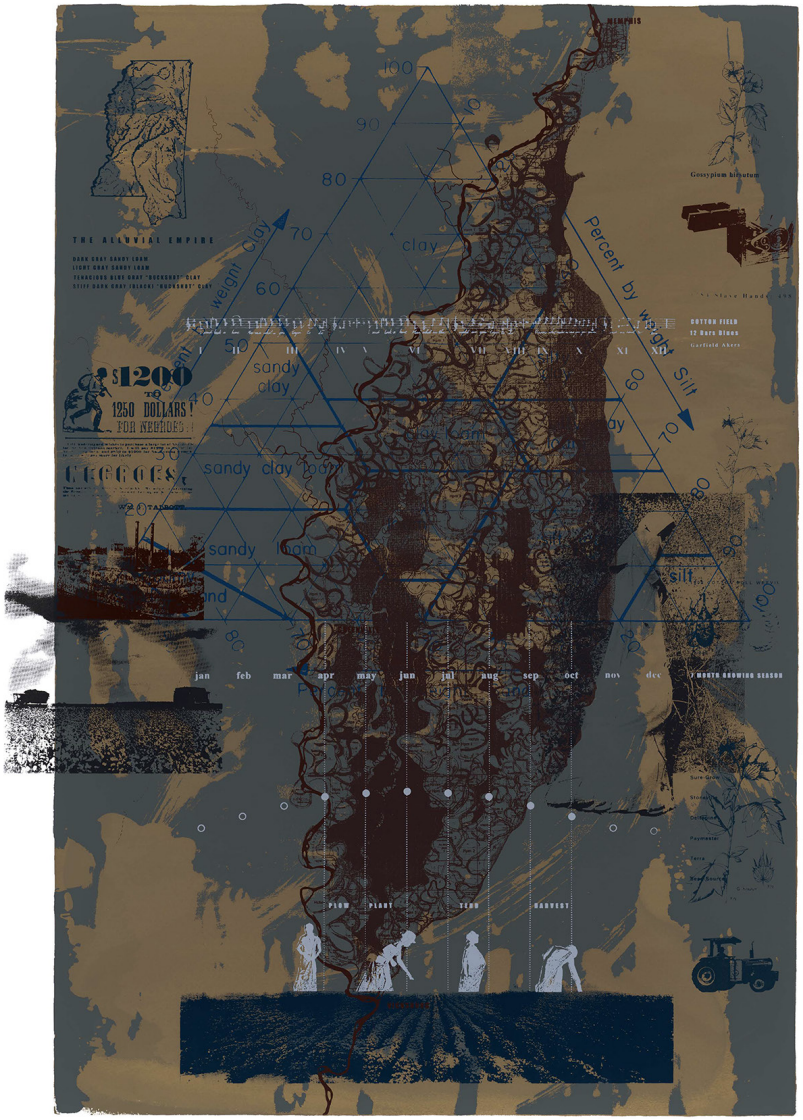
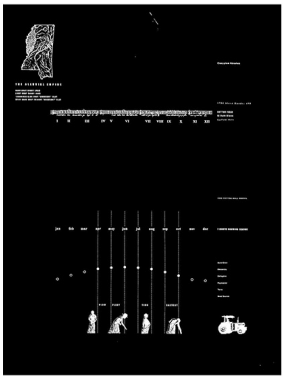


Fig. 1. Problems of the boston image [Lynch 1980, p. 47].





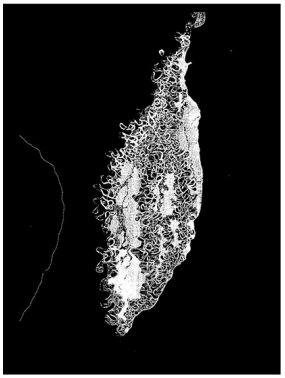


Fig. 2. A. Mathur e D. da Cunha, Mississippi Floods, .

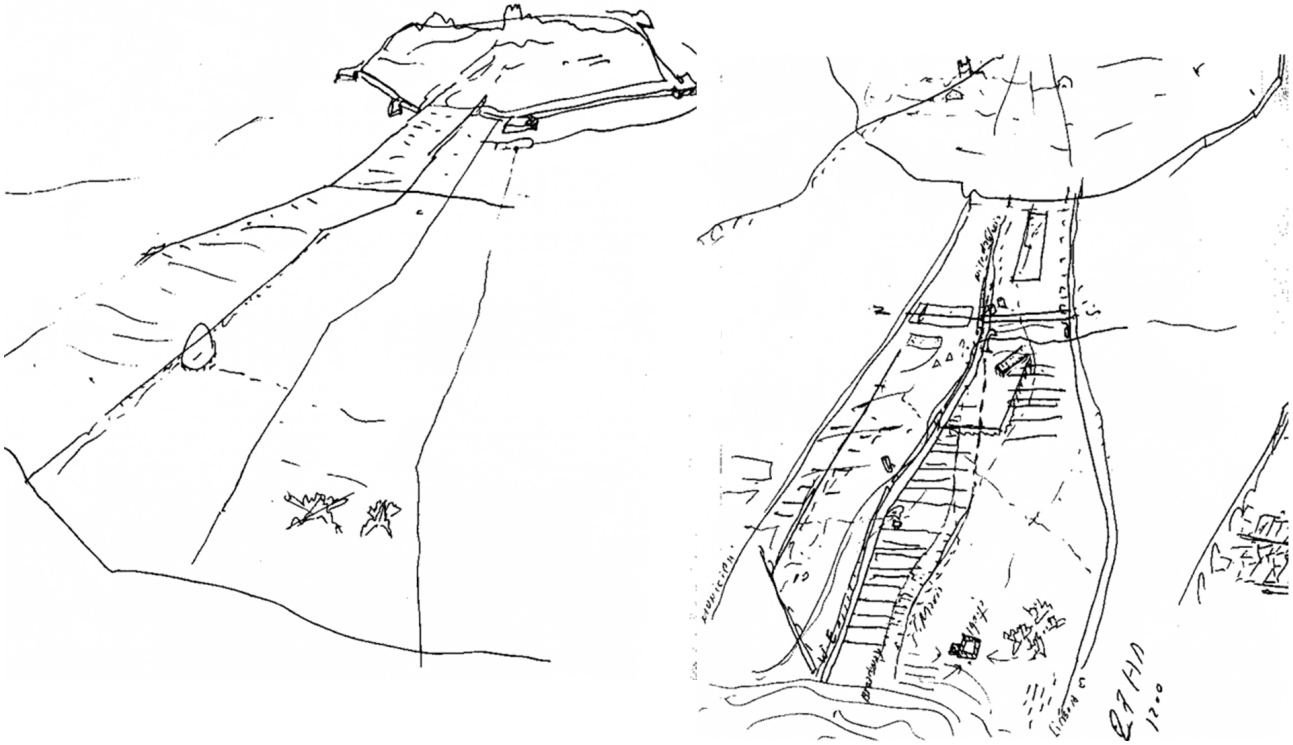


Fig. 3. A. Siza, Malagueira.

of the major visual elements he perceived in the survey; then he reconstructs *The Boston that everyone knows*; and finally he summarises the analysis of the image of Boston with the figure *Problems of the image of Boston* as a first step in the preparation of a 'visual plan' (fig. 1). This last figure is a 'graphic compilation' of what appear to be the major difficulties in the city's image: confusions, stray points, weak edges, isolations, breaks in continuity, ambiguities, ramifications, lack of character or differentiations. This diagram, as Lynch himself admits, corresponds to the analysis-overview phase that does not determine a plan but constitutes a basis on which creative decisions can be made' [Lynch 1964, pag. 46]. As Paolo Ceccarelli points out in the introduction to the text reissued by Marsilio, *The Image of the City* suggests that through certain analytical procedures and on the basis of a number of reading criteria, we can give an interpretation of how the inhabitants of a city perceive it, but also elaborate some methodological guidelines and indicate some useful contents for a better design of the urban environment.

An emblematic and more contemporary case in terms of methods and tools is the research activity of architect and landscape designer Anuradha Mathur with architect and planner Dilip da Cunha conducted between Philadelphia and Bangalore. Their work focuses on controversial territories where nature and culture are inextricably connected. The results of their investigations are not only important for the themes they address, but also for the iconic ways in which the researchers reconstruct and communicate the work itself: the landscape is investigated on multiple layers

that are rendered through evocative and complex diagrams. The hybridisation of multiple techniques and tools is particularly effective in describing the dynamic landscapes that are the subject of research projects such as *Mississippi Floods: Designing a Shifting Landscape* (2001), *Deccan Traverses: The Making of Bangalore's Terrain* (2006) and *SOAK: Mumbai in an Estuary* (2009). The complex diagrams mix graphic signs with photographs and textures, hybridising analogue and digital. An absolutely contemporary practice that already in the first work conducted on the lower course of the Mississippi in California constitutes the transcription of an investigation and constructs the narrative through visual representations of a river that has taken on the characteristics of a flooding landscape, composed of embankments, pumps, dams. This research has developed a working toolkit that brings together direct experience with historical documentation, interviews, maps, historical data and folkloric traditions, and which can be readapted and reformulated to outline scenarios of the complexity of phenomena, conflicts and opportunities (fig. 2).

Turning to another dimension of the project and to completely different and decidedly traditional graphic modes, many of the sketches by Portuguese architect Alvaro Siza give back the measure of that non-imitative contextualism that allows us to grasp the intersection between the project and the interpretation of the place. The relationship between architecture and context in *Evora-Malagueira* can be synthetically visualised in the sequence of the two sketches shown in the figure (fig. 3). The residential complex designed by Siza in the 1970s makes up a peripheral 'modern foundation' in the western sector of the walled city of Evora on the Alentejo plateau. This area, characterised by a rural landscape in which a number of spontaneous squatter neighbourhoods were concentrated, with often self-built dwellings, and bordered to the south by the national road to Lisbon, was criss-crossed by paths traced by the inhabitants' footsteps: traces capable of describing the behaviour of the population along with the topography of the place. On these traces, the new Malagueira neighbourhood is designed with essential building and urban rules with a regular 8 x 12 metres grid of lots, a maximum height of the dwellings set at 6 metres, the same measurement as the width of the streets, a scanning of the façades rigidly controlled in

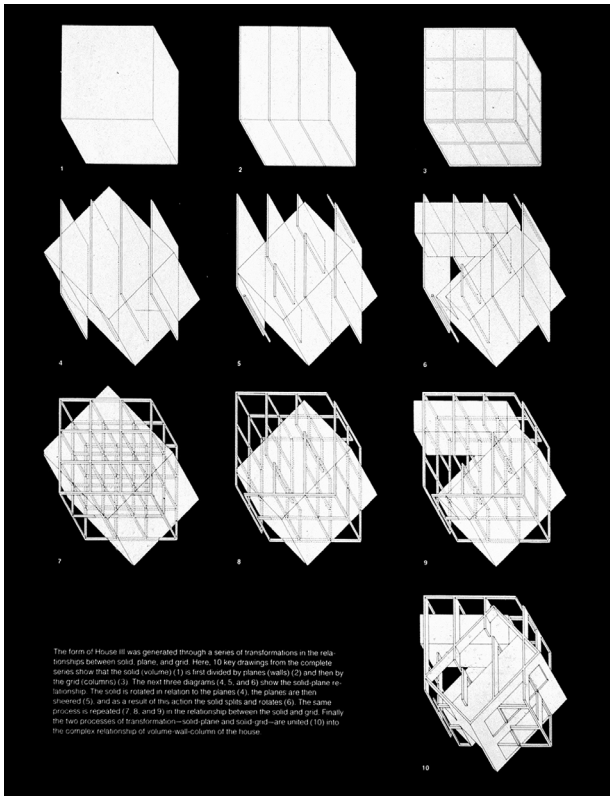


Fig. 4. P. Eisenman, House III.

the openings. Siza superimposes an element of territorial scale to this weave of fabrics, the great sign of the infrastructure 'conduit' that follows the contours of the land. The reference to the mighty 16th-century aqueduct that penetrates the city walls and integrates into the fabric, physically and symbolically connecting the historic city to the territory, is very clear in his synthetic drawings.

If, therefore, Siza's sketch-diagram, from being an analytical tool for interpreting the place, easily slips into a generative and prefigurative dimension of a certain type of project, it is possible, on the other hand, to identify in the celebrated diagrams of Peter Eisenman's first activity the architect's obsession with freeing architecture from all ties to place, function, programme or technique in order to dedicate himself exclusively to formal principles. For this reason, without exploring a complex formalist/structuralist theory that aspires to define the norms and behaviour of the language of architecture as something self-explanatory, we take the houses (fig. 4) that Eisenman worked on in the late 1960s and early 1980s as the paradigm of a process entirely within architecture in which graphic signs become the radical expression of what we can call the diagram as a generative tool. Eschewing the superficial and figurative aspects of architecture and searching for the profound ones (frontality, obliquity, indentation, elongation, compression, slippage) that are perceived with the mind, Eisenman elects geometry alone as the instrument of the project. A geometry in which point, line and plane constitute the elements of the grid in which the above-mentioned categories appear and which define the abstract space in which architectural invention is projected. The result is an abstract architecture, free from contamination, incomprehensible except through the explication of the process, that is, the sequence in time that generated it.

The ability to control the design process through diagramming, even when it is complex and free from formal objectives, sees a significant inflection point in the solutions for the *Villette* park (1982) proposed by Tschumi and OMA. Both proposals, in distant approaches, make use of the diagrammatic tool to articulate a hypothesis capable of absorbing the concepts of indeterminacy, plurality and innovation implicitly suggested by the competition. Bernard Tschumi's prize-winning figurative proposal, as clearly visible in the axonometric diagram (fig. 5), is generated by the combination of three autonomous systems:

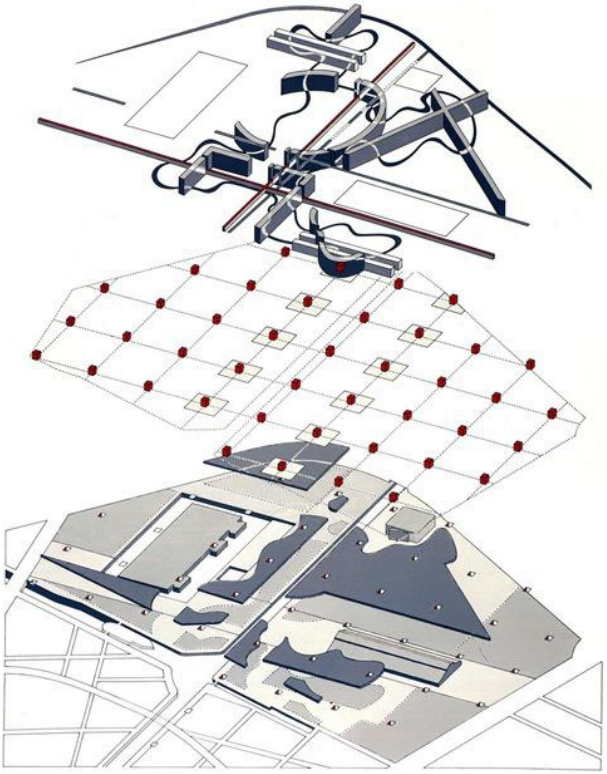


Fig. 5. B. Tschumi, Parc de la Villette.

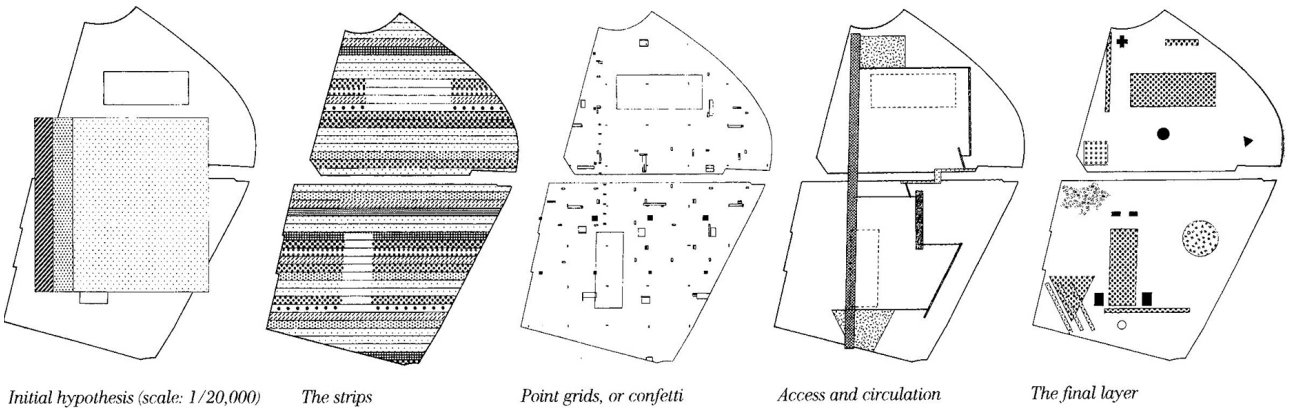


Fig. 6. Studio OMA, Parc de la Villette.

the system of objects, the system of movements and the system of spaces. The three layers in the randomness of their encounter generate, according to Tschumi, 'the new places of contemporaneity'[1]. Koolhaas' hypothesis [Repishti 2015, pp. 44-51] (fig. 6) is also structured on a layered, non-hierarchical flexible and strategic approach. The project area is divided into many parallel strips, strips of landscape obtained from sections of various landscape configurations that delineate a public space in which different activities coexist in mutual interference like a dynamic organism. Koolhaas thus conceives a system of five layers which, overlapping, generate the design of the park. The layers are: the bands; the point grids; the paths; the final layer and the zoning. Koolhaas' avant-garde ideas are characterised by the adoption of a strategy capable of combining architectural specificity and programmatic indeterminacy. OMA considers the park as a dematerialised building reduced to a programme and visualises performative and operational design through the representation of this programmatic structure in the form of a diagram.
Exactly like Koolhaas, at whose studio in Rotterdam he perfected his training, Bjarke Ingels experiments with a post-ideological and post-modern approach to design. He too does not pursue an autonomous formal research but it is primarily the programme that guides the conception and volumetric definition of architecture. His works, today signed with the acronym BIG, which has identified the Danish studio Bjarke Ingels Group since 2005, are almost always told through simplified and synthetic but very effective diagrams composed of a sequence of a few compositional operations (rotation, torsion, addition, subtraction). Already the first well-known residential project, the VM houses (2005), the result of zigzags, steps, slopes, complex circulation and multi-level flats, built in Copenhagen's new *Ørestaden* district, is emblematic of this synthetic approach that clarifies the design genesis. It consists of two facing blocks that are deformed by the action of external forces; the rotations generated between the pieces ensure maximum views of the surrounding landscape. A communicative and design trajectory that Big confirmed in the same place, three years later, with the even more famous residential intervention, Mountain Dwellings, in which concept, functional layout, image and theme are clearly intertwined in a strongly iconic building (fig. 7).

Diagram: metaphorical/composition/relational tool

What has been expressed thus far can be brought into line with a further attempt at categorisation that differentiates the diagram as a metaphorical tool from the diagram as a compositional control or relational tool.

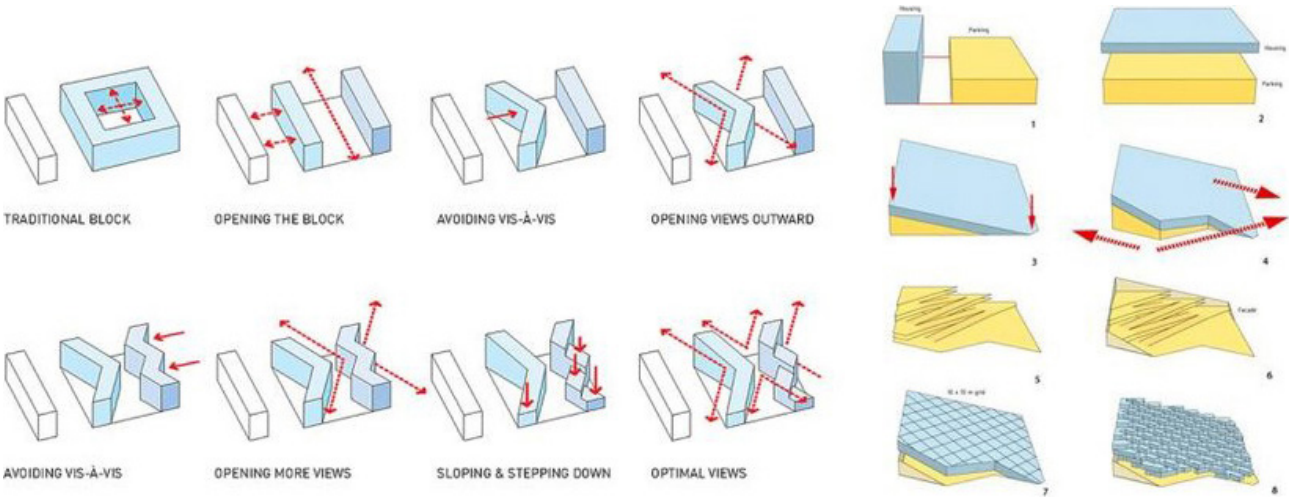


Fig. 7. BIG, VM House + Mountain Dwelling.

The first heterogeneous grouping into which we can include all those synthetic representations capable of expressing the design idea is often based on a mechanism of comprehension by translation, in which concepts or images slide, frequently from other fields, onto the architectural project.
The recourse to the traditional rhetorical figure based on an analogical relationship, whereby a word or locution is used to express a concept different from the one it normally expresses, is particularly useful because metaphor represents a means of enrichment, not only semantic and lexical, but also expressive and stylistic of language. By exploiting the observer's ability to grasp the relationship between two or more objects that have 'something' in common, the communication of the project idea is sometimes given over to other signs: the concept of flows as a river analogy underlying Zaha Hadid's *MAXXI* museum project is an example of this (fig. 8) [Coppola 2015, pp. 157,158]. Naturalistic metaphors' characterise a number of contemporary projects that, with a strong media impact, attempt to bring the built environment closer to the ecosystem and/or landscape.
The above-mentioned Big's Residential Mountain is a system that alludes to a geometrically organic form, organised through a system of terraces and hanging gardens to the south, and which to the north and west even re-proposes, with the holes in the aluminium sheets covering the façades, the image of Mount Everest. The diagrams, which premise the functional issue of the large car park and its pre-eminence over the residential intervention, show the construction of the image-mountain.
A paradigmatic example of a new approach to climate and environmental issues in architectural design is the planetary intervention by the Boeri studio *Vertical ForestING*, which in 2010 sprang up in Milan, focusing on the image of the forest to narrate a tower built with 2 trees, 8 shrubs and 40 bushes for each inhabitant [3]. The construction of the diagrams explicating the building's capacities and characteristics resort to the multiplication of the tree element and a predominant use of the colour green under whose mantle the building tends to hide in order to be able to see the forest (fig. 9).
Alongside the transmission of the idea through similes and evocative images of elements outside the field of architecture, there is a use of the diagram that tends to highlight the designer's ability to work on an idea of space and/or composition. Helpful in specifying this use of the diagram is the simple and highly effective drawing accompanying the project *House* by SANAA/Kazuyo Sejima & Ryue Nishizawa (2002-2005), which tensions a syntactic mode of composition with a paratactic one. The rooms

Fig. 8. Z. Hadid, Museo MAXXI Roma.

traditionally and syntactically stacked under a single roof in a kind of unity are arranged paratactically as prismatic volumes, meticulously juxtaposed against each other on the plane, to form a small village in the forest. The project involves the dismantling of the very concept of the typical house to create an overall structure in almost equally spaced units across the entire surface of the site. Many of the separate parts as individual units serve a single function, such as a living room or bathroom, while the others, each with its own small kitchenette and bathroom, function as an independent mini-house with a small garden (fig. 10).
Finally, the use of the most widespread diagram, on which the full potential of this tool is often crushed, namely that capable of highlighting the functional and relational aspects of the project.
Often reduced to a more fascinating or graphically sophisticated transposition of the 'functional layout', this type of diagram offers interesting developments and intersections with the physical space when it is manipulated by a studio such as OMA. The *Central Library of Seattle* (2004) redefines the library as an institution no longer exclusively dedicated to books, but as a repository of information in which all powerful forms of media are brought together in a precise spiral organisational strategy (fig. 11). At a moment when libraries are perceived to be under threat from a shrinking public realm on one side and digitization on the other, the Seattle *Central Library* creates a civic space for the circulation of knowledge in all media, and an innovative organizing system for an ever-growing physical collection – the Books Spiral. The library's various programs are intuitively arranged across five platforms and four flowing 'in between' planes, which together dictate the building's distinctive faceted shape, offering the city an inspiring building that is robust in both its elegance and its logic.

Conclusions

The diagram, a medium for relating concepts and forms, now plays a central role in architectural production and its narration, enriching traditional systems of representation with multiple contents –functional, compositional, symbolic. The didactic experiences conducted, unprecedented in Neapolitan courses of study and based on an intense relationship with the courses

Fig. 9. Studio Boeri, Bosco Verticale.

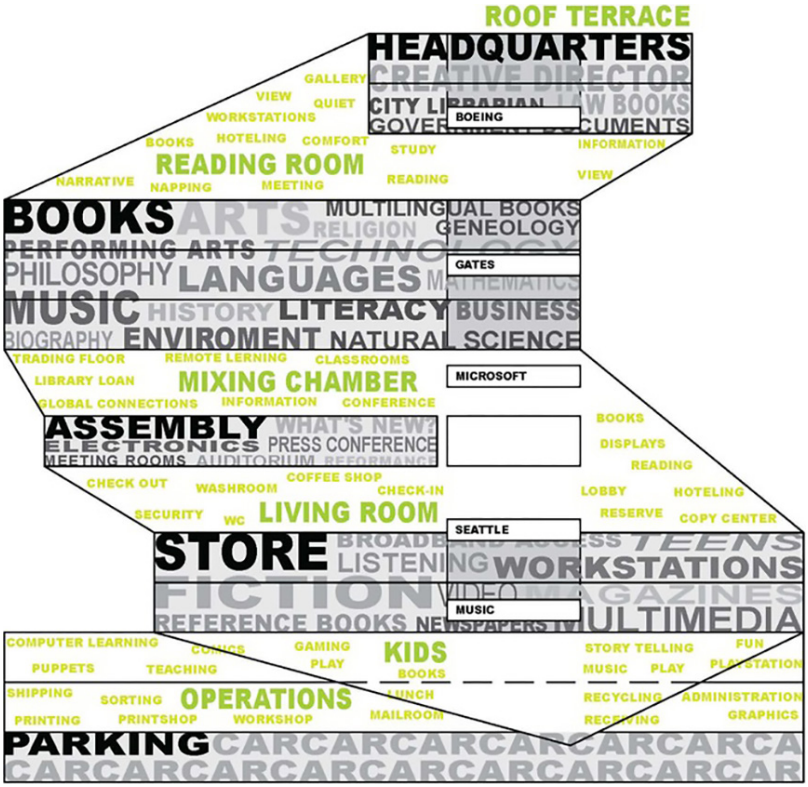


Fig. 10. SANAA, House.

Fig. 11. Studio OMA. Biblioteca Centrale di Seattle.

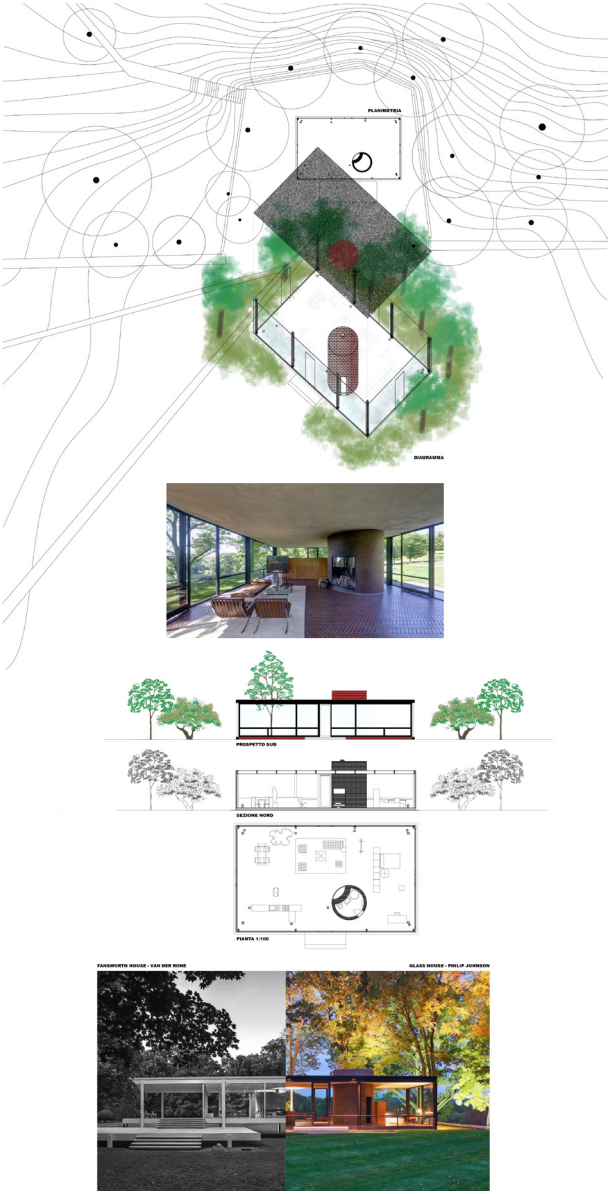


Fig. 12. Graphic elaboration by Alessandro Turzi, student a.y. 2020-2021: P. Johnson, Glass House, 1949.

of *Architectural and Urban Composition*, combined in-depth theoretical investigations with practical exercises, characterising the course with a strongly workshop-based imprint. The topics, of which this text keeps track, were presented by integrating and correlating applied theoretical notions, storytelling tools and compositional techniques with significant examples on the relationship between the project, the process of its elaboration and its communication.
This experimentation was conducted, with small variations in the different academic years, assigning each student the in-depth study of the design of a sufficiently well-known and tendentially iconic author's house such as Tadao Ando's *Casa Azuma*, Alberto Campo Baeza's *Infinity House* or Luis Barragan's *Casa Gilardi-di*. Thanks to the conspicuous bibliographical material readily available for each case study, each student tried to retrace (or reinvent) the design process that led (or could have led) the author to the project, focusing on specific forms, relationships, prescriptions and conditions. Producing a sequence of exercises and starting with the scaled redrawing of plans, elevations and sections, and ending with diagrams and collages, the tenacious freshmen measured themselves against concepts –not immediately clear in their first year of study– such as image, theme, type and character. The different pieces of the story, constructed during the semester, were assembled into a single poster board that was supposed to render, in coherent form, the entire process. While the results from the purely aesthetic point of view of the image were more or less valid, they were certainly effective in building an initial awareness of content, form and communication of the architecture project (fig. 12). A test of this acquired capacity was the repetition of the same process by students, at the end of the parallel Composition lab, for their own (first) project. In the absolute priority of the whole narrative and the importance of the pieces as a whole, the diagram was confirmed as the most effective 'abstract machine' for thinking architecture.

Credits

I would like to thank prof.ssa Paola Scala, who strongly believed in the value of the proposed courses on project storytelling, and arch. Francesca Coppolino for sharing teaching experiences.

Notes

[1] The first system (lines) is the circulation system in which two main axes, straight and orthogonal to each other, underlined by undulating roofs, intersect and join the extreme points of access to the park. There is also the *Promenade Cinématique*, a winding pathway, organised through numerous episodes, consecutive like the sequences of a film. The second system (surfaces) is made up of large expanses, intended as lawns, defined in their form as result spaces obtained from the intersection of the different paths. Finally, the *folies* (points), a point system of objects placed at the intersection of an orthogonal grid that overlap indifferently on the site. These small sculpture-buildings in terms of language make explicit reference to constructivist architecture. Despite the designer's assertions on the absence of hierarchical order between the systems of points, lines and surfaces, considered in composition as equivalent to each other, it appears in the realisation that the system of *folies* is, together with the covered paths (the lines), an essential element in the spatial definition of the places.

[2] The diagram is just one of the tools used by Bjarke Ingels to describe his buildings. Ingels is a skilful and histrionic communicator and has certainly contributed to radically changing the ways and languages with which architectural design is narrated. *Yes Is More: An Archicomic on Architectural Evolution* (2010) is his most famous publication, conceived as BIG's manifesto. It is not a traditional monograph, but an exuberant "archicomic", a neologism coined ad hoc by the author.

[3] <https://www.stefanoboeriarchitetti.net/vertical-foresting/> (accessed on July 24, 2023).

[4] <https://oma.eu/projects/seattle-central-library> (accessed on July 24, 2023).

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