Lluis J.

Studied architecture at Technische Universität Wien (TU Wien), Escuela Técnica Superior de Arquitectura de Valencia (Valencia ETSAV), and Escuela Técnica Superior de Arquitectura de Madrid (Madrid ETSAM). He is a professor at the Master in Advanced Architectural Projects at Madrid ETSAM, a PhD candidate at the Polytechnic University of Madrid, and was Wortham Fellow at the Rice University School of Architecture (2015–2017). Liñán's research focuses on the impact of digital dissemination media on architectural design, and his writing has been published in journals such as CIRCO, Bartlebooth, and PLAT. He is also founding member, along with Andrea Gimeno and Xevi Lluch, of rellam, a small and nomadic design cooperative. Their built and speculative work has been awarded several competition prizes and exhibited at the 2016 Venice Architecture Biennale.

Liñán

AUTOMATIC FOR THE PEOPLE

“At the beginning of the Modern Age, the power of identical copies arose from two parallel and almost simultaneous developments: on the one hand, identicality was an intellectual and cultural ambition of the Renaissance humanists; on the other, it would soon become the inevitable by-product of mechanical technologies, which it has remained to this day. It is Alberti’s precocious and relentless quest for identical copies of all kinds that makes his work so revelatory in this context. Most of his inventions failed, but many of his ideas thrived. Predicated upon the same mandate of identical reproducibility (in this case, the identical translation from project to building), Alberti’s definition of architecture as an authorial, allographic, notational art held sway until very recently, and defines many if not all of the architectural principles that the digital turn is now unmaking.

The shaping of complex geometries and of irregular, ungeometrical or “free” forms, which was the first and most visible achievement of the digital turn in architecture, may have been a transient incident. But due to CAD-CAM integration, and counter to the Albertian principle of separation between notation and construction, digital architects today are increasingly designing and making at the same time. Acting almost like prosthetic extensions of the hands of the artisan, digital design and fabrication tools are creating a curiously high-tech analog of preindustrial artisanal practices. Traditional craftsmen, unlike designers, do not send blueprints to factories or building sites: they make with their hands what they have in their minds. The objection, so frequently raised, that this new mode of digital artisanship may apply only to small objects of manufacturing is theoretically irrelevant: any big object can be assembled from smaller, digitally fabricated parts.

Ultimately, Alberti's modern and humanistic authorial tenet, which called for the final notation of an object (its blueprint, in twentieth-century parlance) to be materially executed without any change, may also be doomed in a digital design environment. Projects (and not only for buildings: the principle can be generalized) are increasingly conceived as open-ended, generative scripts that may beget one or more different objects—redesigned, adapted, messed up, and tampered with by a variety of human and technical agents, some of them uncontrollable and unpredictable."[1]

Mario Carpo,
From: *The Alphabet and the Algorighm*
2011

[1] Mario Carpo, The Alphabet and the Algorighm (Cambridge, MA: MIT Press, 2011), 44–45.

Five principles define any digital object according to media theorist Lev Manovich: *numerical representation* (all digital objects are made up of code and can be described mathematically), *modularity* (all digital objects are discrete and can be divided into parts), *automation* (all digital objects can be programmed and produced automatically by computers), *variability* (all digital objects are editable and hence variable at their most essential level), and *transcoding* (all digital objects require computers to be translated into readable data in multiple forms by humans).[1] Although these principles have little or no connection with the semantic field traditionally associated with design theory and manifestos –with, perhaps, the exception of modularity– they have unwittingly set the tone for the architectural discourse in the last twenty-five years or, in other words, ever since the last of these principles became a reality in the world of architectural design. In fact, we could say that the embracement of the computer as the primary medium for the production of architectural projects has been paralleled by theoretical propositions pivoting, more or less explicitly, around the creative potentials that stem from each one of these five attributes.

Beginning with the formal universe resulting from the ability of computers to represent and to model complex geometries and numerical data, and followed by explorations of scale-less continuity between architectural objects and the city as parts of the same, uninterrupted system, the first decade of the digital age in architecture revolved around the possibility of thinking and putting into practice a brand-new formal vocabulary that could not be imagined without the computation capabilities of the new medium –a possibility that lost momentum when the first deflation of the digital

[1] Lev Manovich, The Language of New Media (Cambridge, MA: MIT Press, 2000).

economy revealed that the connection between electronic tools and physical objects was not as immediate as initially envisaged. In architectural discourse, new forms gave way to new forms of practice, and the turn of the century subsequently moved on to explore the potential of variability, this time as an attribute belonging not to the architectural object but rather to the architectural project, the most direct product of architectural labor.

Mario Carpo's *The Alphabet and the Algorithm* appeared in 2011 as one of the most relevant assessments of this change of mentality. Building on notions of interactivity and responsiveness that result from the inherent variability of digital creations, the text revolves around the crisis of the notational "identicality" between object and design in the era of information technologies, an "identicality" that, according to Carpo, had been a major cornerstone of modern culture since the XV century. To put it simply, the Italian theorist argues that the modern was an era of "identical copies," i.e., an era rooted, first, in the division of design and fabrication as two separate, consecutive phases of production and, second, in the idea that an object should appear as an identical copy of its design. At both levels of conception and fabrication, digital technologies sever this division, thus calling for a redefinition of the modern paradigm of building by design.

In many ways, the book could be read as a continuation of the main ideas developed by Carpo in his previous work, *Architecture in the Age of Printing*; a book that ends with a chapter devoted to the diagonal connections between the professional model put forth by Leon Battista Alberti in the XV century and the emergence and expansion of the printing industry in Europe during the XVI century[2]. In *The Al-*

[2] Mario Carpo, Architecture in the Age of Printing: Orality, writing, typography, and printed images in the history of architectural theory (Cambridge, MA: MIT Press, 2001).

phabet and the Algorithm, the Italian theorist elaborates on this chapter and identifies the convergence of the theories of Alberti and the development of the printing press with the dawn of the modern paradigm of "identicality" between building and design. Carpo explains that, unlike Brunelleschi, Alberti constructed his theory around the separation of architecture in these two consecutive phases –first the project and then the object– arguing that the design of the building was the actual work made by the architect. As a consequence, in order to identify an architect as the author of a building, it became necessary to conceive of the latter as an identical copy of the former or, in other words, it became necessary to regard buildings as precise and invariable translations of drawings into three-dimensional objects.[3] In short, the association of authorship with design, the linear division of design and construction, and the notational sameness between project and building became the foundations the Albertian model of production.

The printing press consolidated this model practically and intellectually, for it allowed architects to work on their designs remotely, to reproduce them with accuracy, and, more importantly, it turned into a cultural reality the possibility of producing (a world of) identical copies stemming from authored designs. "Printing, a ditto device,"[4] opened up an era of multiples and standards in the realm of objects and ideas.

According to Carpo, the paradigm theorized by Alberti and enabled by the printing press grew to become one of the benchmarks of modernity and found its true realization when assembly lines and commercial catalogues filled the world

[3] A translation that, as we know from Robin Evans' meticulous analysis of the chapel dome of the Anet Castle, can only be notational.

[4] Marshall McLuhan and Quentin Fiore, The medium is the massage: An Inventory of Effects (New York: Bantam Books, 1967), 49-50.

with standardized objects. After all, the material nature of the Industrial Revolution made it necessary to standardize components and products in order to generate economies of scale, which in turn were reciprocated by a culture ruled by sameness and repetition. In this genealogy, modernism appeared as the boldest manifestation of this cultural paradigm in the field of architecture. Today, it still appears as an unyielding reminder of the inseparable connection between construction and design, regardless of the position, autonomy, and value we assign to these terms in the equation of architecture.

The immaterial essence of the Digital Revolution hindered the balancing of this equation by revolutionizing, first and foremost, just one of the sides –that of design. That's perhaps one of the reasons why, in just twenty years, the discourse around the digital in architecture has oscillated multiple times between form and process with apparent ease, or even discomfort. Interestingly enough, Crapo's book insightfully captures this inherent problem, pointing out the troubled adaptation of architecture to an era ruled by electrons. To him, the most important consequence of the rise and expansion of digital technologies from a theoretical perspective is the reversal of the modern paradigm of building by design inaugurated by Alberti and the printing press. This reversal unfolds, however, in two different and uneven ways. First, the division of design and construction as two consecutive phases is overcome. Second, the authorial model associated with the modern system of production finds a new definition.

Speaking from a broader perspective, Carpo argues that digital technologies, not only allow designers to comprehensively think and work with three-dimensional digital models but also bypass the need of recurring to (human) intermediaries in the process of the materialization of their

designs. By means of the CAD/CAM duo, digital media enable a direct translation from the space of the screen to the space of the table, and, in doing so, they put pressure on the linearity of the interaction between object and design. A mediator capable of re-presenting code also as a physical construction, computers have the capacity to recreate in tangible reality the inherent variability of digital products –a capacity that gives birth to a new consumer culture no longer based on sameness but similarity. To put it differently, mass standardization gives way to mass customization at the precise moment when the main driver of technological development shifts from industry to information.

Notwithstanding that the so-called maker's culture stands today on the basis of this shift, it is clear that architecture is still far from sidestepping the need for intermediaries in the translation from drawing –or digital model– to building. In fact, it almost seems that, as it happens with 3D-printed objects, in order to become a direct outcome of what happens on the screen, architecture should embrace a sensible reduction of its material complexity, somehow displacing standardization to a different frequency. In architecture, then, the end of sameness, rather than being a consequence of a new way of building, becomes another way of coupling the rise of digital media with some of the inherent traits of postmodern culture.

Carpo, seems to acknowledge this fact in the text, and he ends up focusing on authorship as the true warhorse of digitization in the world of architectural design. Here, the text pinpoints a fundamental proposition often neglected in the debates around "the digital" in our discipline: in becoming a digital object, it is the project, and not so much the building, that turns into a variable product. Consequently, it is the project, and not so much the building, that lends itself to the new configurations and modes of operation that stem

from the new media.
That is to say that, in its digital transfiguration, it is architectural representation that has directly assumed the mediating role of the computer and, in doing so, the connection of a design with the hand of the architect has been challenged and - with it - the authorial model that characterized the discipline since the XV century. Computers turn the backbone of any design into a numerical representation made up of variables, i.e., dimensions, material properties, or coordinates that can be determined by the architect. Alternatively, it can be left open in order to enable the participation of external agents in the definition of the final configuration of the project. To Carpo, this possibility calls for new forms of practice that renounce full authorial control over the project and focus instead on the articulation of an interactive design process that turns the participation of clients, future users, and other professionals into a projective instrument, a sort of "split agency" by which the architect operates as a "generic author," designing the essential formal principles of the object but leaving its final definition to other agents. Participation and collective intelligence, rather than folding, parametricism, or topology, are to Carpo the keywords of the second decade of the Digital Turn in architecture.

Arguably, we could say that Carpo´s final advocacy for participatory practices entails an evolution, rather than a reversal, of the Albertian model of building by design. If the Renaissance theorist defended a disembodiment of the process of making buildings, then, with digital technologies, it is the process of making designs that becomes disembodied, escaping full authorial control by the architect and lending itself to the decisions of other actors. Among these, there is one that stands out, albeit conspicuously silenced: the medium itself. If the modern conception of authorship teeters with the advent of digital technologies, it is because the tools we use to produce architecture have become autonomous to

the point of weakening the link that connects the decisions of the architect with the configuration of the project. In this context, it is quite literally the medium, the computer, that becomes the spokesperson of any design, operating as a negotiator with the ability to bring together disparate voices – as Carpo points out– and, more importantly, with the ability to speak up.

Ultimately, *The Alphabet and the Algorithm* can be read today simultaneously as an insightful analysis of the change of mindset that occurred in the first decade of the 21st century with regard to the potential of digitization in architecture and as an indicator of the principle of new media that would define the following decade: automation.[5] However we decide to read it, it is a text that stands out as a reminder of the primary importance of design and representation in any architectural endeavor, particularly in a moment determined by the immaterial nature of information technologies.

[5] Interestingly enough, Crapo's recently published book, The Second Digital Turn: Design Beyond Intelligence, elaborates on the idea of "the participatory turn that never was".