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Editorial

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ArchiDOCT 17th aims at exploring the theme of ‘data’ in the built environment and their recurrence and currency in either the realm of theory or the realm of applications. Even though the topic has been seemingly exhausted in recent years, a systematic record of approaches to doctoral education on the built environment and data has not been undertaken. The breadth and the various degrees of ‘granularity’ will be showcased in this and the forthcoming issue of ArchiDOCT towards indentifying the potential of data to (in)form or even shape tomorrow’s built environment.

Considering the breadth of the discourse on data, and an effort to understand their relevance to the design process through both a theoretical or practice-based approach, we could not exempt ourselves, also in regards to the reader, from framing our exploration from a precisely theoretical point of view and manifesting our critical position within this vast field of interest.

In 1980, the American Sociologist Alvin Toffler published his famous book *The Third Wave* (1980). In the text, he maintained that different eras have succeeded each other based on different sources of value. The *First Wave* coincided with the agricultural society, which mostly prevailed after the Neolithic Revolution lasting several thousands of years. The *Second Wave*, covering a span of time of around 150 years, is related to the Industrial Society which, according to Toffler, is based on «*mass production, mass distribution, mass consumption, mass education, mass media [...] standardization and synchronization*». Finally, the *Third Wave* took place when most countries transitioned to a globalised society where relationships among people and political and economic structures were significantly altered by the disruptive impact of new technologies. At the core of this shift lie data, information, and their treatment. New models arose and the incidence of this transition has impacted the domains of architecture and design.

To contextualise our discussion even better, we can recall another fundamental moment in the history of science and technology. In 1989, at the International Society for Gen-

eral Systems Research, American organizational theorist Russell Ackoff presented for the first time a graphical representation of the **DIKW** pyramid. Rather than a simple descriptive model, the latter defines purported structural and/or functional relationships among **data**, **information**, **knowledge**, and **wisdom**. With regards to Ackoff’s theorization (1999), data stand for a set of pure symbols and signals, hence stimulus, which represents the founding properties of objects and events. Thus, data are basic particles of knowledge, while the latter represents the complex forms of rules, patterns (synaptic connections), and algorithms, through which data are processed, interrelated and then visualized, in order to obtain a specific meaning and presence in the realm of existence.

More than ever, architects need to develop a powerful (human) computer “eye” (Pedrycz, 2005) – a sensitive, critical, and knowledge-based one in order to understand data and undertake sensible decisions. The key to this process stands in ‘clustering’ data to discover their inner structure and give meaning to the granularity which they are composed of. Since the 1930s, the rapidly growing interest on this topic, together with the fast technological development of the last decades, had given birth to methodologies and algorithms that were predominantly data-driven and where any optimization was exclusively data-oriented. Thus, our purpose, as architects, is to understand the influence that data can have on architecture and urban planning; to expand the limits and the new possibilities of data for, from, with, and, against the built environment. Furthermore, we need to explore two different - but interrelated – moments of clustering procedures: how data are gathered, and how to build meaningful platforms to describe multidimensional and heterogeneous data spaces.

«*Many forms of data are far more useful as visualization*» stated Ian Millis (2017) in his *Data Visual: Editorial essay* published in 2020 on ArtLink. And surely, their proper visualization allows us to create design models where the magmatic amount of data is interrelated and dynamically inter-

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twined as responsive material. Through the correct analysis and representation of data, we can constantly simulate by designing and design by simulating and, quoting Fritjoj Capra (1996), instead of ending up with ‘static things’ we deal with interconnections.

It becomes clear then, how the last four decades of research in the field of architecture and the urban environment have been strongly influenced by the presence of data. This ongoing relationship between the latter and the struggle to instill in them an intention. Whether we refer to the macro or the micro-scale, architects have been trying to collect and give meaning to the magmatic amount of data in which we are constantly submerged. Sensors and actuators in the city, computational design process, script-based generative procedures, AI disruptive speculations, the Internet of Things, Big Data, are just some of the examples of almost half a century of heterogeneous research trajectories. From a first phase of inebriating experimentations based more on pushing the technological tools to their limit, a second phase of the research on ‘data’ relates more to their capacity to ontologically address the meaning of the discipline itself and disclose new strategies to manage the complexity, and ethics, of the world at large.

The 17th number of *ArchiDOCT*, entitled *DATA*, precisely wishes to investigate tangible examples of their implications either for applied design strategies or for research purposes, with the main aim to (in)form the debate regarding data and enlighten on their proper use within the architectural domain.

The appeal and the breadth and diversity of a large number of submissions for the issue of data was astonishing. The different points of view and critical reflections on the topic were so rich that the Editorial Board decided to dedicated the forthcoming issue to be published in February 2022 to *DATA* Part II. The current volume, *DATA* Part I contains essays on *Data and Cases Studies*, and *Data Software and Building Technologies*.

Intelligence and Co-Creation in Smart Specialisation Strategies. Towards the next stage of RIS3 is a choral contribution from several established scholars in this field¹ for our ‘a Good Practice Example’ section. The essay focuses on some of the key points extrapolated from the Online S3 project, funded from the Horizon 2020 program of the European Commission. Using a specific set of methodologies for strategy design, the main aim is to facilitate the implementation and actuation of Research and Innovation Strategies for Smart Specialisation (RIS3). The paper presents some of the past challenges faced by the program and offers an overview of the future ones to be addressed. Moreover, it discusses how strategies could be further improved by the implementation of critical datasets, and also facilitate the collective intelligence and the process of solutions co-creation.

The first essay, delivered by **Nicola Tasselli**, PhD candidate at the University of Ferrara, together with his advi-

sor, Associate Professor **Federica Maietti**, is entitled **Data management implementation. New strategies addressing built assets**. Through the text, they discuss the impact of digital technologies and data modeling in the field of survey and representation, giving some results to properly direct the data processing phase. The parametrization of elements, and the standardization and, indeed, replicability of solutions through BIM technologies allows a geometric data enrichment either on the ontological or semantic point of view. Starting from the consolidated Italian tradition in the field of restoration and conservation, the paper proposes to extend the procedures now applied to Herigate-BIM also to a more widespread built heritage.

So similar, so different: diving in the physical and acoustic features of two theatres. A case study, is the paper submitted by PhD candidates **Blanca Pérez-Aguilar** and **Alberto Quintana-Gallardo** together with PhD architect **Ana Llopis** and professor **Ignacio Guillén-Guillamón**, from the Centro de Tecnologías Físicas, Universidad Politécnica de Valencia, Valencia, Spain. Through specific case studies (precisely two theaters) in the city of Valencia, the paper investigates how the combination of geometrical and sonorous data can be used to understand the actual spatial conditions of the buildings and propose more informed design strategies. Following the description of the actual buildings, and their condition within the consolidated urban environment, comparative analysis based on a three-axes strategy (geometric, acoustic absorption, and onsite analytic data) is presented and critically discussed by the authors.

Asiye Nika Kartal, PhD candidate from the Department of Architecture and the Built Environment, University of Nottingham, through her work **More phenomenology less visual: A haptic narrative and a proposed haptic ‘Sense-marks’ database of Istiklal Street, Istanbul**, approaches the topic from a phenomenological point of view. The city of Istanbul, and specifically one of its streets, is seen as the perfect context to discuss the concept of the haptic dimension of the space. The essay states that still today many of the haptic characters of the street are visible and proposes that this should be implemented as a proper design strategy for the different authors involved. The author proposes the creation of a database where ‘haptic features’ could be gathered and then further qualitatively analyzed.

Knowledge economy’s externalities and urban growth. An analysis of the functional dynamics and location patterns of knowledge-based industries in the Metropolitan Barcelona, is the title of the paper from PhD **Juan Eduardo Chica**, Department of Architecture and Habitat, Tadeo Lozano University, Bogotá, Colombia, and Associate Professor **Carlos Marmolejo Duarte**, from Centre of Land Policy and Valuations, Polytechnic University of Catalonia, Barcelona, Spain.

The contribution focuses on the Centrality of knowledge-based industries (KBI) in the economy of metropolitan areas

¹ The paper presented here as a good-practice example is an excerpt of a longer paper of XXX pages. Authors: Nicos Komninos, Christina Kakderi, Anastasia Panori, Eva Garcia, Katharina Fellnhöfer, Alasdair Reid, Vladimir Cvijanović, Mona A. Roman, Mark Deakin, Luca Mora

in regards to their labor markets and promotion of new forms of urban growth based on KBI specialized clusters. The Barcelona Metropolitan Region (BMR) is used as a case study for a Proxscal Multidimensional Scale Analysis which explains the relationship between all the economic sectors. Furthermore, the essay suggests how such a data-driven approach can be reiterated, on multiple scales, also to other urban data contexts.

The last essay for this issue, entitled **DATA and Information in Architectural Design Process through Building Information Modeling: A New Epistemological Horizon of BIM Methodology**, is an original work from PhD **Pablo Andrés Gómez Granda**, and Associate Professor **Alfredo Montaña Bello**, both from the Faculty of Arts and Design (FAD), Universidad de Bogotá Jorge Tadeo Lozano, Bogotá, Colombia. Starting from distinct projects conducted by the authors (*Contemporary Architecture in*

Colombia and Optimization of building management through the implementation of digital twins), the essay explores the pedagogical aspect of the results through some dedicated design workshops. BIM software is used to train the students in architectural design competencies. The dynamic model of the building is the vector to trigger students' capacities of lateral thinking and also to improve the decision-making aspect of their design strategies. The main aim is not only to empower the students through a mixed practice-based/theoretical approach but also to promote the need for the development of a new epistemological model for architecture education in Colombia.

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REFERENCES

Ackoff, R. L. (1999). *Ackoff's Best* (pp. 170–172). John Wiley & Sons.

Fritjof, C. (1996). *Web of Life: A New Scientific Understanding of Living Systems*. Anchor Books.

Millis, I. (2017). Data Visual: Editorial essay. *ArtLink*.

Pedrycz, W. (2005). *Knowledge-based clustering: From data to information granules*. John Wiley & Sons. <http://doi.org/10.1002/0471708607>

Toffler, A., & Alvin, T. (1980). *The third wave* (Vol. 484). Bantam books.