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Editorial

RSD6. Linking systems thinking and design thinking in architecture and urban design

The Relating Systems Thinking and Design Conference Series started at the Oslo School of Architecture and Design as a seminar arranged by Birger Sevaldson and his co-teachers in 2012. It emerged out of the need to search for alternative ways for designers to deal with complexity. Systems perspectives have a long history in architecture and design. However, systemic approaches in design have not made it to the forefront of the profession or academic design research. The reasons for this are many, but central is the question of linking systems thinking with design thinking and practice. Taking on this challenge has been the main goal for the RSD conferences, as it also has been for the informal emerging network that was formalized in 2018 as the Systemic Design Association (SDA). RSD conferences have taken place in Oslo at the AHO - Oslo School of Architecture (RSD1 2012, RSD2 2013, RSD3 2014 and RSD6 2017), in Banff (RSD4 2015) and Toronto at the OCADU – Ontario College of Art and Design University (RSD5 2016), in Torino at the Politecnico di Torino (RSD7 2018) and in Chicago at the IIT - Illinois Institute of Technology (RSD8 2019). These efforts have resulted in an international network and emerging field for design professionals and academics.

The sixth Relating Systems Thinking and Design Symposium (RSD6 2017) was held at the Oslo School of Architecture and Design in Norway in October 2017. The central theme of the symposium was “Environment, Economy, Democracy: Flourishing Together”, and called for contributions on democratic participation and policy innovation, sustainable business innovation, flourishing communities, and related systems-thinking-oriented approaches to architecture, settlements and the built environment. A wide range of contributions addressed themes, such as social impact in flourishing and change programs, health and population wellness, ecological design and bioregion development, human-scaled and regional economies, related sociotechnical and technological systems, etc. Yet, while the five earlier symposia did receive a number of papers that were focused on architecture and urban design, RSD6 was the first RSD symposium with a dedicated paper session on architecture and urban design. This special issue of *FormAkademisk* collects together five of the papers that focus on architecture and urban design from a linked systems-thinking and design-thinking perspective. Each article pursues a distinct theme concerning the development of the profession, performance-oriented architecture and urban design, the role of exterior space in rethinking the architectural envelope, and questions of participation and community building. This breadth of themes in the selected articles indicates the increasingly deep impact of systems-thinking in the fields of architecture and urban design.

The history of architecture is rich in systemic approaches to the subject matter, starting from Vitruvius’ treatise “De architectura” (*Ten Books of Architecture*) and onward. When the discipline of architecture was formally established circa 1800, systemic approaches continued, such as, for instance, in the work of Jean-Nicolas-Louis Durand who set forth the notion of type in architecture in “Recueil at parallèle des édifices de tout genre anciens et modernes”. It is generally believed that Durand was inspired by advances in the then also newly formalized

discipline of biology, and more specifically by Cuvier's advances in comparative anatomy, who in turn was inspired by Linnean taxonomy. In such works, the focal point was invariably the architectural object, the building with its expression and appearance. Nonetheless, intense differences prevailed among many architects and authors that engaged in systemic treatment or that rejected it as hampering creativity.

The early 20th century witnessed the emergence of the discourse on form and function, which further fuelled arguments regarding what the subject matter of architecture is or ought to be and therefore, what and to what extent should be systematically treated. Systems and the notion of performance in architecture began to take shape in the 1930s in the context of the work of the Structural Study Associates (SSA) (Buckminster Fuller, Fredrik Kiesler, Carl Theodore Larsen, Knut Lönberg Holm, et al.). Suzanne Strum noted that the SSA, "propagated a radical technologist and productivist manifesto that anticipated the systems and communication theory that emerged in the post-war era. Their position regarding advanced technology and information has a contemporary resonance. Already in the early 1930s, the SSA introduced such seemingly postmodernist terminologies as performance, emergence, emergency, ephemeralization, biologic design, networks, mobility, flows, decentralization, ecology and entropy" (Strum, 2012, p. 35).

With an expanded take on the object and its interaction with the environment systems, theoretical reflections and methods and systems-thinking took hold in various approaches to architecture. A first marked peak of the notion of systems as well as performance occurred in the period from the late 1950s to the late 1960s as part of a predominately hard-systems-theoretical approach to design problems in architecture and engineering, the utilization of cybernetic approaches (Sukrow, 2018) and models and the advent of the use of computers in architecture. Important foundational works took shape throughout this period (see e.g., Alexander, 1964; Forrester, 1969; etc.) and culminated in a series of publications focused on the topic of *performance design*, such as, for instance the August 1967 issue of *Progressive Architecture* under the same title. While the underlying engineering-based hard systems approach was soon rejected by mainstream architects, particular systems-based approaches nevertheless continued in specific circles yielding quite some attention, such as, for instance, Jay Forrester who initiated and developed system dynamics and especially urban dynamics in the 1960s and 1970s, with the aim of modelling the behaviour of complex systems.

With the emergence of actor network theory (Latour, 2005), systems-oriented design (Sevaldson, 2013), as well as a second peak of the notion of *performance* in architecture and the arrival of performance-oriented architecture and urban design (Kolarevic & Malkavi, 2005; Leatherbarrow, 2009; Grobman & Neuman, 2012; Hensel, 2010, 2011, 2013; Hensel & Sunguroğlu Hensel, 2019), softer systems approaches began to spread more widely supplementing more engineering-related harder systems approaches in architectural and urban design. Advances in environmental considerations, participatory design (Simonsen & Robertson 2012), as well as discussions focusing on expanded stakeholder notions derived from actor network theory that include nonhuman actors (Grusin 2015) furthered the need and use of expanded systems thinking. This as well as increased research efforts in architectural practice and education are beginning to make an impact on the transformation of the discipline. The selected articles give evidence of these developments.

Articles in this issue

The first article by **Michael U. Hensel and Søren S. Sørensen**, entitled *Performance-oriented architecture and urban design - Relating information-based design and systems-thinking in architecture*, examines a performance-oriented approach to architectural and urban design that focuses on the interaction between architecture and its specific local settings and environments. The authors' aim is to expand performance-oriented design in architecture to urban design and to integrate architectural, urban and landscape design into a multi-scalar and multi-domain approach. As such, this research is elucidated along three individual research-by-design efforts

that include: first, designs for urban areas with focus on demographic and environmental aspects; second, designs for peripheral areas with focus on preserving or restoring vital local bio-physical conditions and interrelations; and third, designs for rural areas that elaborate an integrative approach towards constructions and correlated land uses. This approach links computational information-based design with systems-thinking and design-thinking aspects and was undertaken at the Research Centre for Architecture and Tectonics and the Advanced Computational Design Laboratory at the Oslo School of Architecture and Design.

The second article by **Sareh Saeidi**, is entitled *Envelopes and exteriority - Local specificity and extended exterior as design criteria for architectural envelopes*. This work also examines the relationship of architecture to its surrounding environment. Here the objectives are to reposition the relationship of architecture and its surrounding exterior by expanding the understanding of architectural envelopes and to investigate and define exterior space as design input. The research systematically establishes key terms, pursues case studies that consider exteriority as design criteria, and furthermore, involves research-by-design inquiry to combine a systematic approach with design thinking through design experiments. The discussion focuses on conceptual and method-oriented approaches with the aim to develop an integrated design approach focused on climatic and atmospheric performances of architectural envelopes. Sareh Saeidi is a researcher and doctoral candidate at the Research Centre for Architecture and Tectonics and the Advanced Computational Design Laboratory at the Oslo School of Architecture and Design.

The third article is by **Jotte de Koning, Emma Puerari, Ingrid Mulder and Derk Loorbach** and is entitled *Landscape of participatory city makers - A distinct understanding through different lenses*. It starts from the premise that “today, citizens, professionals, civil servants, social enterprises, etc. form different types of coalitions in order to overcome the challenges that our modern cities face”. The article examines the characteristics of these different groups and describes ten distinct types of city makers. The authors acknowledge that these types of city makers can all bring value to the city, but posit that this value can be increased through participatory approaches “to stimulate cross-overs and accelerate the transition towards sustainable futures”. With this, the discussion of participatory city makers commences, which proposes that participatory approaches, interactions and networks need to be developed along with improving conditions for possible innovation. The authors develop approaches by way of joint design and systems thinking to explore and elaborate the transformative potential of different types of participatory city makers that they see vital to flourishing and sustainable communities.

Article four by **Helen Avery and Nihal Halimeh** is entitled *Crafting futures in Lebanese refugee camps - The case of the Burj El Barajneh Palestinian camp*. The article portrays an initiative at the Burj El Barajneh camp which is run by a network of local associations. The initiative “aims at improving living conditions, services, infrastructure and livelihoods for the inhabitants”. The camp has a large number of active associations and many educated professionals that are valuable resources. However, the authors caution that any intervention in the dense context of the camp can have significant consequences and needs therefore to be considered with great care. Furthermore, the authors point out that prototypical solutions may be inappropriate and ill-adapted to local circumstances. Due to this realization, the authors explored a different approach based on collective design and collaboration that involved the inhabitants of the camp. This includes “systemic design as situated and socially positioned practice” as well as “action-oriented design approaches in community settings”.

The fifth article is by **Christos Chantzaras** and is entitled *Architecture as system & innovation design discipline - A retrospective on architectural programming and its implications for the strategic extension of the discipline of architecture*. In his article, Chantzaras posits that “talking about architecture means talking about buildings, but also talking about processes or systems” and that “architecture is a way of thinking and looking at people, spaces, interrelations and interactions”. The article examines characteristics of

architects that work with context and complexity based on the practice-oriented architectural programming method, an approach from the 1960s that offered architects a basis for applied architectural design thinking. However, this approach did not receive broad attention from practitioners and academics. In this article, the method is discussed and compared to design thinking in industrial design. This involves detailed discussion of a real-life project and students' works from a seminar at a department of architecture at the Technical University in Munich. The article examines current and future relevance of an advanced version of architectural programming for architectural practice and education and concludes with an emphasis for strengthening the core skills of architects by developing a design thinking method rooted in architecture and that architecture should be understood as a "systems & innovation design discipline" in fields of systems thinking and innovation research.

This collection of five articles can only give a first impression of just how broad the impact of linking systems thinking and design thinking has become, not only in architecture and urban design but also in landscape design. It seems reasonable that this trend will persist. For one, the coupling of systems thinking and design thinking with objects and systems is beginning to erode the artificial dichotomy between form and function that has divided architectural discourse for a century. It will be interesting to see how far and in what way the RSD conferences will continue to play an active and strategic role in this development.

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