

Prologue: Beyond single use: looking back and looking forward at the open building movement

With the passing of Nicholas Wilkinson in 2017 and John Habraken in 2023, we find ourselves at a critical moment of reflection on the intellectual and performance legacies of the Open Building (OB) movement. For those who may not be familiar with the OB approach, it was initiated by Habraken in the early 1960s and advanced through his research consortium, the Stichting Architecten Research (SAR). *Open House International* was first published as SAR Open House with Wilkinson serving as editor, a role he continued the rest of his life (Hurol *et al.*, 2017). According to the first issue, the publication had three functions. “(1) to publish other people’s work, which is based wholly or partially on SAR’s philosophy and methodology; (2) to publish other people’s work, which is based on different concepts and methods but which pursues similar objectives and (3) to publish SAR’s own work and views in response to 1 and 2 above” (Wilkinson, 1976). The journal has evolved significantly over time but continued to center around issues related to OB until the last several years, “due to the conscious and deliberate broadening of the content of the journal” (Hurol and Salama, 2020). As you will see in the articles that follow, the philosophy and methods of OB have also expanded and transformed significantly over time. From its inception as a critical response to the constraints on personal agency of post-WWII mass housing in the Netherlands, OB methods have been developed and tested for nearly every building typology and urban context across the globe.

The themes of this special issue build on a 2023 international symposium organized in Boston by Ben Carlson and the guest editors, Joshua Lee and Joseph Murray, with other members of the [Council on Open Building](#). “Beyond Single Use: Open Building, Architecture and Urban Design,” featured presentations from noted academics and innovative practitioners from the fields of architecture, urban planning, engineering and public policy. The symposium picked up on current themes highlighted in recent books about OB, such as Stephen Kendall’s *Open Building for Architects: Professional Knowledge for an Architecture of Everyday Environment*, as well as the ongoing work of The International Council for Research and Innovation in Building and Construction (CIB) W104 – Open Building Implementation group and a group of practicing architects in The Netherlands connected to [OpenBuilding.co](#).

The collection of papers in this special issue entitled “Beyond single use: looking back and looking forward at the Open Building Movement” provides critical historical and personal reflections, longitudinal case studies, urban considerations, pedagogical experiences and visions of things to come for the future of the OB movement. We begin with “Open building: an abbreviated history and a look forward,” an insightful paper by Stephen Kendall, a former student of Habraken and prolific author on OB. With equal measures of hindsight and foresight, Kendall provides a detailed reflection on 40 years of personal experiences as an educator, researcher, inventor and stalwart advocate for OB and looks to future possibilities. As chronicled by Kendall, OB has a complex set of ideas that have evolved significantly over time. What began as Habraken’s critique of post-WWII mass housing in the Netherlands as devoid of inhabitant agency has expanded to other building typologies and has been tested in thousands of built projects embedded in diverse geopolitical contexts. Kendall adroitly summarizes OB as a set of interrelated characteristics, including (1) separating tasks, (2) themes and variations, (3) territory, (4) hierarchy and (5) change. OB advocates separating design and production tasks by scale, which helps avoid issues of centralized control and differentiates between *supports* (what is shared and thus longer lasting, inclusive of urban infrastructure) and *infill* (what is not shared and thus short term). Others call this Core and Shell plus interior fit-out or skeleton/infill. This is similar in concept to Kisho Kurokawa’s



powers of five spaces, which provided space for nature (5^5 – 5^8 years), cultural facilities (5^3 – 5^4 years), associations (5^2 – 5^4 years), living ($5^{1.5}$ – 5^3 years), services (5^1 – $5^{2.5}$ years), durable consumer goods (5^0 – 5^2 years) and equipment (5^0 – 5^2 years) (Kurokawa, 1977) and Stewart Brand's Six Ss shearing layers of change diagram (Brand, 1994), which assigns expected lifecycles to the site (eternal), structure (30–300 years), skin (20 years), services (7–15 years), space plan (3–30 years) and stuff (daily to monthly) (Brand, 1994). For OB advocates, designating themes and variations of patterns, types and systems for projects at larger scales simultaneously provides variation and flexibility while achieving coherence. Territorial autonomy is also an important concept for OB and one of the reasons why raised floors are often utilized on OB projects. Most multi-story commercial buildings use dropped ceilings because they compress floor-to-floor heights by allowing sloped plumbing lines which perforate the slab above to run between structural elements. This is a violation of territorial autonomy because it requires permission from the tenant below to change plumbing locations above. Hierarchy (also called “levels of intervention” in OB parlance) is closely connected to the separation of tasks described above because it calls for distributed but structured control. Urban planners and policymakers provide the basic rules for urban designers, who in turn set the context for architects who provide space for interior designers and so on. This division of design labor helps provide helpful boundaries that ensure no single person has too much control. And finally, change is seen as inevitable by OB advocates and is intentionally planned for in their projects. However, this heavily depends on the context. Change may be quite slow or relatively fast, even or uneven, expected or unexpected. Therefore, OB projects must be thoughtfully tuned to their surrounding environment and sociotechnical forces. Kendall suggests more focus on the pragmatic benefits of the first characteristic over the others because it benefits those who typically make final decisions about the built environment and ultimately provides more inhabitant control by default. Kendall also calls for more practice-oriented work on new design and management tools, advanced labor training, new financing and regulatory measures and assistance from artificial intelligence.

The next three papers provide longitudinal reviews of built projects based on OB principles. “Patch22 vs Top-Up, a comparative case study of two open buildings” analyzes and compares two built multi-use projects designed by FRANTZEN *et al.*, an innovative Dutch architecture firm, and developed by Lemniskade BV. Rather than providing a typical public relations puff piece for recently completed work or an external critique, this article by Tom Frantzen and Caroline Cornelia Kruit provides a personal account and reflective second look at their own projects and offers valuable insights for developing OB projects within the technical, legal, architectural and economic limits of real-world practice motivated primarily by the goals of sustainable circularity. To accomplish this, Patch22 was completed in 2016 to meet whichever residential or commercial building code was more demanding, thereby enabling users to adapt the building for either use over the life of the building. Frantzen and Kruit provide innovative details of the floors, walls and oversized elevators, as well as combinable subdivisions for both projects that highlight the issue of territorial autonomy discussed above. They also used scenario planning and capacity analysis to imagine 24 possible floor plans that the owners might choose. A post-occupancy survey of the finished building revealed that none of these plans were used, which Frantzen and Kruit take as evidence that their *supports* provided even greater flexibility for *infill* than they imagined. Unfortunately, changes in Dutch law made the later project less flexible even though technically it affords greater adaptability, but this underscores the importance of OB advocates continuing to make the case and build networks with policymakers, insurance organizations and financiers.

“Reflections and lessons after 15 years and over 70 R&D projects in KUBIK, an adaptable test bed building for constructive technologies,” provides a second case study of an OB project by those who know it best. KUBIK is an industry and government-funded research building constructed in 2010 in Spain that features demountable facade systems with over 3,000 sensors connected to a digital twin to test, evaluate and validate the construction, deconstruction and performance of industrialized facade systems. The team of researchers and authors of this

article, Peru Elguezabal, Izaskun Alvarez-Alava, Rosa San Mateos, Jose-Tomas San-Jose-Lombera and José Antonio Chica Páez, expand on an earlier article published in OHI about the ambitions for the project shortly after its completion ([Chica *et al.*, 2011](#)) by documenting the successful adaptation of the system to dozens of research projects over 15 years. The vast majority of the tests performed at KUBIK have focused on heat transfer and constructability of facade systems. This focus on facade elements is relatively rare for OB projects, but Osaka Gas Company's Next 21 building stands as a notable exception. For the KUBIK team, the key OB principles include distinct levels, user/stakeholder participation, transformation and adaptability, system interfaces, continuous design process and multi-actor collaboration. They conclude that the number and variety of research projects KUBIK has facilitated provide strong evidence that these principles have been fundamental to its success.

Our third case study, "Designing for change—Open Building for education," by John Dale, co-founder of the USA-based Council on Open Building, presents a recent series of school buildings in California designed to accommodate natural and human-caused disasters, alternative pedagogical methods, new technologies like AI and VR and shifting demographics. According to Dale, these buildings are the first educational buildings in the USA designed to explicitly follow OB principles from the outset. By working collaboratively with teachers, administrators and design consultants, HED and co-designers Moore Ruble Yudell, their design used six layered strategies – (1) a structural grid with reversible moment-frame connections, (2) a large, open central volume, (3) vertical circulation placed at the perimeter, (4) distributed mechanical systems, (5) a raised floor with demountable partitions and (6) a long-lasting facade that is considered part of the base building. The team extensively used capacity studies to test the flexibility of these strategies. Although the first building was only completed four years ago, evidence is mounting that they were successful. Dale notes changes to the program that were accommodated during construction, fine tuning of electrical and data port locations based on individual teacher needs and reconfiguring the computer lab as an e-sports lab. He notes that it is important that post-occupancy studies should be conducted over time to test these initial findings.

"Examining the open building movement through the adaptive reuse of Toma Church in Türkiye" by Tuba Nur Olğun and İbrahim Kürşat Akarsu explores the application of OB principles through a proposed change in use of a historic religious structure to a flexible cultural center. Olğun and Akarsu rigorously document the existing condition of the church; search archival documents and other literature and compare this church to similar churches in the area for important historical context and attempt to trace the building's transformation over time. They then analyzed the existing building for consistency with OB strategies and proposed appropriate alterations to make the building functional again as a cultural center and for other future uses. For them, the most important OB principles for this project included support and infill distinction (the original stone structure versus portable and interchangeable modular partition panels as well as foldable and portable furniture), circulation flexibility (via reopened doorways), long-term spatial transformability and modularity (modular mezzanine structures and portable service areas) and urban context integration (a reconstructed entrance portico). To this list of OB strategies, they restored access to natural light and added accent lighting that highlights the original structure. Although this work is just a proposal, Olğun and Akarsu suggest that their work could serve as a design guide for others who wish to incorporate OB principles into cultural heritage sites.

Moving from the building scale to the urban scale, "Development of PLANiT as a toolkit for sustainable urban development based on urban system attributes: a systematic literature review," written by Lavanya Pant, Aditi Nag and Neha Saxena, offers an alternative framing of OB through a rigorous search and review process of 154 peer-reviewed papers focused on attribute keywords related to urban system development. It is important to note that their screening process did not explicitly focus on OB and eliminated literature unrelated to SDG-11 (sustainable cities), books, non-English sources, articles that are not open-source and other grey literature (sources that are not peer-reviewed), but their article provides a helpful

expansion beyond OB-specific literature that connects urban system attributes to those common to OB, especially modularity, adaptability and stakeholder participation. The extensive citations should help readers expand their knowledge base or work aligned with OB. Pant, Nag and Saxena applied what they learned from this literature by proposing a Planning Integrated Toolkit (PLANiT), a table that connects attributes with subattributes and core indicators that are aimed at policymakers and urban planners.

We were also happy to include “Modularity in transition: reconciling open building principles with early design education,” from Bora Aldemir and Bora Yasin Özkuş, which explores the pedagogical value of combining OB, modularity and Japanese Metabolism in design studio projects. Their article highlights the related concepts that worked well as well as those concepts that were more difficult to incorporate into the students’ work. In general, OB and metabolism both promote modularity and adaptation, and both use biological metaphors as inspiration. However, the two are quite different when it comes to scale and agency. According to these authors, the five key principles of OB are (1) support-infill distinction, (2) hierarchical levels of control, (3) user participation, (4) adaptation mechanisms and (5) technical coordination. Along with these principles the instructors added the use of modular capsules from Japanese metabolism. Aldemir and Özkuş see studios as a perfect setting for learning about OP because it is typically an open-ended environment where the interaction with other learners and instructors leads to reflective and generative knowledge. Their findings indicate that OB can be a pedagogical tool that helps develop systems thinking, time-based awareness and informed judgments about the tensions between industrial standardization and participatory flexibility. However, the results were uneven among the students, and there was insufficient development along technical and logistical considerations. This was largely due to this being a second-year studio, so they recommend incorporating OB throughout the curriculum to enable greater depth of these critical skills.

For over 60 years, OB’s influence on architectural practice and academic theory has been productive and has the potential to address the unfolding impacts of climate instability, rapid urbanization, and the need for greater socio-spatial agency. To conclude this special issue, Joseph Murray provides a synthetic commentary that outlines how OP is well-positioned to address the polycrisis we find ourselves in today through new ways of conceptualizing, financing, designing, constructing and maintaining urban environments.

Joshua David Lee

Sources

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