

# The “Convivial” Home: Resolving Emerging Building Technologies with a Culture of Self-Repair

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Architectural technologies are expanding in scope and complexity at an astounding rate. In the West, this acceleration has been matched in medium- and large-scale buildings by institutionalized care in which specialized professional teams oversee the operation and maintenance of technologies that stand beyond the technical capacities of the buildings’ average user. Until very recently, the small single- or multi-family home had uniquely resisted this institutionalizing trend, participating instead in a much older culture of self-repair by building users, themselves. In my New York practice and at other building sites in the US, Mexico and Europe, I have watched with curiosity and no small amount of trepidation as small homes begin to more and more pervasively incorporate technologies of institutional complexity. Increasingly, architects, builders, and homeowners are choosing technologies that limit or forbid homeowners’ direct engagement with the repair of their homes, leaving them instead with a choice between costly contract maintenance services and the environmentally damaging practice of trash-and-replace. More damaging still, this cultural shift removes from the homeowner their traditional connection to and expression through their homes, for many the sole geography over which they have any true autonomy.

Beginning with an understanding that these issues stem not from technologies themselves but their patterns of implementation, The Austrian cultural critic Ivan Illich has developed a schematic distinction between “convivial” and “industrial” tools that bears out the inherent virtues of the former and the problematic nature of the latter. I would like to use Illich’s distinction as a lens to better understand the emerging issue of an industrialized culture of home repair – not only for the aptness of its descriptive faculties to us as observers, but also for its positive prescriptive power for us as designers and builders: those on whose shoulders the ethical deployment of new building technologies falls.

At the center of these questions and of Illich’s distinction is an important presupposition: that buildings are inherently anthropocentric. That is to say, technologies are adopted or foregone, are “good” or “bad”, insofar as they concretely benefit or detract from human lives. The central distinction between “industrial” and “convivial” tools lies in the way that they relate to human lives. “Industrial” tools are so called because they adopt a set of assumptions from industrial production about the virtues of specialization in thought, labor, and control. Like industrial production, these technologies deliver positive outcomes to people. Industrial tools and industrial methods work for us; they give us things. In the introduction to his treatise on technology, *Tools for Conviviality*, Illich contrasts this with what he calls “convivial” tools, charging that in our post-industrial world, “people need tools to work with rather than tools that ‘work’ for them.”<sup>1</sup>

Industrial tools work insofar as they deliver an end-product to us effectively and dependably. Industrial tools work for us. Convivial tools work in that they permit us to work; they assist us effectively and dependably in achieving our

<sup>1</sup> Ivan Illich. *Tools for Conviviality*. p.10.

own ends; they work with us. From this “with” Illich derives his highest virtue: “conviviality”; *con-vivere*; with-living.

Central to Illich’s preference for convivial tools is the role they play in providing freedom to their community of users. This freedom is not that libertarian idea of an infinitely extended openness for the maverick pursuit of one’s own ends independent of social context but rather an opening within a community for individuals and groups alike to bring forward the best expression of themselves; to meet problems and needs directly with fitting solutions and provisions. In effect, this limited freedom allows members of a community to introduce, strengthen and test new values in concrete forms. The sociologist of labor Richard Sennett has described this process as *auto-poiesis*, suggesting that, “human beings create through mutual exchange the systems of value by which they live... there is interaction between physical creation and social behavior.”<sup>2</sup> Illich advances this limited self-expression as fundamental to human thriving: just as the nature of one’s tools conditions the opening or closing of this space for expression, so to do they promote or detract from one’s well-being.

The technologies that together make up a home, considered as tools for the achievement of certain human goods – shelter, security, self expression, sense of place – can be deployed and used according to either tool-paradigm: we have said that technologies operating under each paradigm “work” in their own ways for the homeowner. During periods of normal use, we might see some advantages to industrial tools in the home: many are self-regulating; as manufactured goods, they often outperform home-made solutions within the limited space of their intended function; they may generate a level of pecuniary and labor savings through the efficiencies inherent in them. The problematic nature of these tools is often hidden during the course of normal function, only truly surfacing at the moment a home breaks down in some way.

It is at this point – the moment of repair – that the user themselves would historically step in and take advantage of a simple home’s open structure in order to solve the issues raised by its breakdown while simultaneously altering the home to better express their own needs and values. The simple home presents as a convivial tool for its users, facilitating free expression by working with them, throwing up few barriers to their access of the structure itself, materially and conceptually understood. By contrast, through the arc of breakdown and repair a home centered on industrial tools provides the greatest resistance to access – limiting a users ability to:

- 1) access the building’s material to manifest their own best solution
- 2) understand the building’s conceptual organization in order to maintain or modify it
- 3) legally lay hands on the guts of their tools without repercussions
- 4) afford the added costs of repair or replacement.

Through the schema of these four gates – points of access or obstruction – we can begin to study in greater detail the distinction between homes convivially and industrially organized, and between the related cultures of self- and institutional repair.

<sup>2</sup> Richard Sennett. “The Open City.”

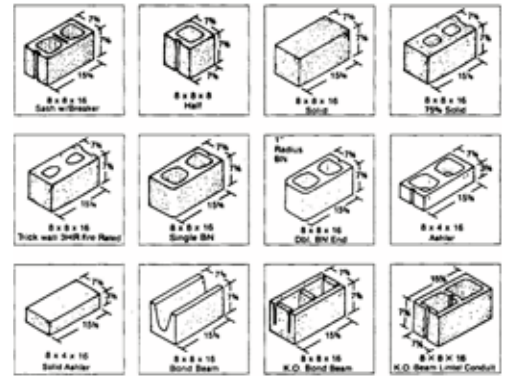
## Criterion 1: Physical Accessibility

Stick framing and masonry massing, the primary structural elements of western housing, are easily mastered and can be repaired in widely divergent ways using a wide variety of tools – quite literally whatever might be laying around. Even as more complex elements are introduced to the system – plumbing, insulation, hardware, air circulation systems – each continues this pattern of flexibility and accessibility. New pieces, patches, bridges, extensions to these systems can be found at local hardware and home repair stores and there is little concern that a new part will fail to mesh with the existing building fabric. Historically, it was a goal of most producers of building technologies that elements meant for middle class domestic construction have a high degree of interoperability: the “two-by-four”, the common brick, 4’ x 8’ sheets of virtually anything under the sun, duct cross-sections in 2” increments. These constitute a system of readily interactive parts whose elements are infinitely modifiable by ready means. In many ways the 20th century American house epitomizes the convivial tool: a structure that a homeowner can work with to achieve her own unique and appropriate ends.

By contrast, the parts of many industrial technologies fit exactly where they fit and do exactly what they are meant to do – no more and no less. Whether they be as small as a circuit board or as broad as a prefabricated wall system, their parts are not readily manipulable by the common person without breaking the whole. The physical “stuff” of these industrial tools forbids free and direct manipulation by the homeowner, compelling them instead to choose from a menu of outcomes provided by paid specialists or to purchase proprietary replacement assemblies with functions limited by their designer-programmers. Other times specialized elements are deployed by the manufacturer to intentionally limit access, a practice Illich calls an, “institutional monopoly on manipulation”.<sup>3</sup>

## Criterion 2: Conceptual Accessibility

When one considers the systems that make up an average house built anytime up to twenty years ago, especially given the liberty to strip them and manipulate their parts or to watch someone else do so, one can quickly grasp the purpose and operation of most of what one finds. This conceptual clarity is made possible by the dual elements of physical simplicity and interoperability highlighted previously. I can see the grain structure of a stud, see it cup and swell, see it be consumed by termites. I can feel the weight of a CMU, notice how its cavities align when stacked. It is readily apparent how a joist hanger takes a joist. I can see the mechanics of a fan, a valve; of threaded elements, male and female. Furthermore, common building elements present me with obvious signs and symbols that allow me to relate directly to my home and to understand how it could be manipulated. The Phillips head screw and hex head bolt are literal registers of the common tools used to manipulate them but also signs to the user of what might be manipulated and how. The half-punched openings in a junction box not only serve as a flexible system of creating openings but as a diagram of how the element could or should be used. In the American house of my childhood, I can understand the whole of my building and thereby begin to master its care myself. While I may initially lack the *techné* required to physically finesse certain elements, I can understand and re-conceive of them with a minimum of formal education. Illich puts it thusly:



Convivial Tools: Simple Parts Designed to Interact Broadly<sup>A</sup>



Industrial Tools:  
Complex Parts with Specialized Relationships<sup>B</sup>



Convivial Tools:  
Elements Speak to Their Own Use and Manipulation<sup>C</sup>

<sup>3</sup> Illich, p.22

<sup>A</sup> W. W. Thompson concrete products

<sup>B</sup> gpshead/Flickr

<sup>C</sup> Bosch Tools

*One can understand fully what a goldsmith does without being one oneself. Men do not have to be cooks to know how to prepare food. This combination of widely shared information and competence for using it is characteristic of a society in which convivial tools prevail. The techniques used are easily understood by observing the artisan at work.<sup>4</sup>*

New, industrially deployed home technologies often present to homeowners as conceptual black boxes. In part because of the tiny scale of its operations and in part because of the sealed nature of its physical skin, digital systems like the Nest thermostat are reduced for the homeowner to the flatness of their user interface screens, which have no true one-to-one correspondence with the actions of the system behind the curtain. When the curtain is pulled back, homeowners are not presented with signs and symbols that help them make sense of what is before them. These systems tend not to be made up of easily understood primaries but of myriad further blanks whose precise potentials are often unclear to the uninitiated. This failure to understand, and therefore to know where to begin repairs, both precipitates and is exacerbated by the new culture of seeking specialist outside labor to handle issues off the bat: now the homeowner doesn't even try to open up the assembly before they pick up the phone.



Industrial Tools: Elements are Complex and Closed<sup>D</sup>

### Criterion 3: Regulatory Accessibility

It is not often that we take note of or praise something for being generic but it is this very generic-ness of object and idea that gives the greatest freedom at the lowest cost to the homeowner. Compared to institutionally-scaled buildings, few elements of the common home are owned or regulated such that they cannot be modified, replaced, repaired, or inventively re-purposed at the sole discretion of the homeowner. While home repair has not historically participated in the innovations adopted by institutional architectures, it does have a rich culture of simple, one-off, site- or problem-specific innovations driven by a dearth of limitations. The elements of typical home construction are not menaced by the shadows of great cost or fragility, or by the imposition of “correct” behaviors dictated in warranties and liability documents. They can be cut up, melted down, twisted, fudged, glued, screwed, stacked and played with until a solution to the problem at hand is reached, all without great consideration of what is “allowed” or “approved” or “not in violation”.



Convivial Tools: Generic Elements with Little Regulation<sup>E</sup>

New home technologies are very often marketed not as generics but as proprietary products belonging to this company or another. Because the homeowner lacks the confidence and mandate to repair these technologies themselves, they often find themselves beholden to warranties and “care packages” that further separate them from the free exercise of their energies to maintain their homes. Producers also take great strides to prevent knowledge of their technologies from being cultivated and disseminated by homeowners and by the class of skilled helpers we have relied on in the past. In my practice, I talk regularly with frustrated craftspeople who are compelled by producers to shell out time and money to become “certified” to work on a branded product. Often, an experienced contractor must carry a certification from every major producer of a given technology, earned by paying for an



Industrial Tools: Special Qualifications are Required for Access<sup>F</sup>

<sup>4</sup> Illich. p.58

<sup>D</sup> ophelia/Amazing Lighting

<sup>E</sup> Volodimir Bazyuk/Shutterstock

<sup>F</sup> Mitsubishi Electric

attending many hours of classes, when the guts of all of these products are fairly similar and made up of the same elements he has manipulated for half of his life. As producers narrow the range of allowable repairs and repair methods, they rule out almost entirely the old culture of inventing new solutions with old parts – of innovating and advancing the home through creative maintenance. If homeowners want to take on this closed organization of parts, ideas and legal constructs, they are forced, in effect, to operate in a fringe world, a pirate world in which a simple mistake can have large cost and legal implications.



Industrial Tools: Self-repair is Discouraged by Financial or Legal Pressures<sup>5</sup>

#### Criterion 4: Price Accessibility

For most people in the West, industrial tools, which require capital to obtain and maintain, are far more expensive than the products of their own labor produced in concert with convivial tools. This disparity is amplified when we speak of a “product” as material- and capital-intensive as a home. Illich rightly points out the economic leveling power offered by convivial tools, which take advantage of a non-pecuniary wealth: personal energy under personal control, “the one resource that is almost equally distributed among all people.”<sup>5</sup> The convivial home is structured to take advantage of the labor – mental and physical – of its users. The parts and tools that are required for its repair and modification are standardized and genericized to the point of being cheap and easy to obtain. By the input of labor and with minimal capital users can make repairs that suit specifically the circumstances of a breakdown as it relates to their particular homes and lives. By the same means they can readily modify their structure towards better expressions of their community values.



Convivial Tools: Freedom to Exercise Personal Energy Under Personal Control<sup>6</sup>

Because of the above-mentioned physical, conceptual and regulatory limits, it is increasingly difficult for users to apply their own energies towards the repair and modification of the industrial tools now laced through contemporary homes. Where the power of their own muscles and minds are limited, the power of their wallets remains. In vacuum left by the denial of self-repair, two significant alternatives have developed. The first, long favored by the wealthy but increasingly adopted by the middle class, is contract repair. Today, when a technology breaks down, specialists in a given industrial tool are dispatched to repair or modify that tool within a set of physical and legal limits and according to their own standards of best practice. These teams of experts come at a cost greatly exceeding the time-value of the homeowner working for themselves and even of traditional skilled repair-assistants like plumbers, plasterers and carpenters. Also unlike those tradesmen, whose work we choose to engage as a surrogate for our own, the involvement of the new expert class is virtually compulsory: our choice is often to engage them for whatever fee they ask or to live with a state of disrepair.



Industrial Tools: Capital Replaces Labor; The Homeowner is beholden to expert contract maintenance or compelled into a cycle of trashable, replaceable components.<sup>1, J</sup>

The alternative favored by the increasingly large number of people who cannot pay this fee or will not entirely relinquish the autonomy of choice is the industrially-fueled cycle of trash-and-replace. If a homeowner wishes to engage with new technologies but cannot modify these technologies to their own ends when they cease to function, an alternative exercise of autonomy is to discard the old tool and replace it with a newer, more apt one. The freedom associated with the old convivial home is perverted into a “choice” from the market – a market limited by the production goals of technology companies. Besides the environmental impact of this materially-wasteful practice, it damages our own world-conception by fueling the choice-limiting production of industrial tools while covering over this fact with the illusion of choice.



<sup>5</sup> Illich. p.11

<sup>6</sup> secnews.gr/ Absent Mia

<sup>H</sup> Millstein Jewish Archives

<sup>I</sup> Getty Images

<sup>J</sup> Getty Images

Understanding better the effects of industrially deployed technologies on the culture of self-repair and the virtues of technologies convivially exercised, we should remind ourselves that technologies themselves are not at their core biased one way or the other. We must remain aware that most new technologies can be convivially configured if we are to move forward as designers of future homes and not collapse into an undue luddism. Per Illich, “Convivial reconstruction... impl[ies] the adoption of labor-intensive tools, but not the regression to inefficient tools... Neither must a convivial society be stagnant. Its dynamics depend on wide distribution of the power to make effective change.”<sup>6</sup> Illich’s call to us as home builders is to look critically at the technologies we are weaving around our clients’ lives so that we may weave for them homes that they can genuinely live with; con-vivere.

We as designers, those who spec and direct the installation of building systems, have an ethical imperative to bestow upon the future residents of our buildings the best technologies they can afford, structured for convivial use. We can do this by ensuring that the elements with which we make new homes and renovate old ones are self-repair friendly. We can also use our profession’s power over the building-tech market to compel producers towards simple, flexible offerings where they have begun to do otherwise. We can take back the subtle virtues of our old culture of repair without giving up on the obvious virtues of new technologies.

Using the four criteria laid out above, it is worth exploring a contemporary practice that is committed to these values: designing new homes that prioritize a convivial relationship between home and homeowner. I hope to offer a few brief examples through a study of the work and ideas of Chilean architect Alejandro Aravena, whose firm, Elemental, has made it a significant goal of their practice to provide good quality contemporary houses for entire communities, and to ensure that those houses are repairable, modifiable and extendable by those communities, themselves.

### **Criterion 1: Physical Accessibility**

In a truly open system there is no right way to employ the physical elements of building; no hard and fast rule-set for the use of a building’s base “stuff”. So long as this remains true, no great expertise or instruction manual is required to crack open one’s own home and make it work better for oneself. This is perfectly present in the “progressive housing” initiatives taken up by Elemental across their home country of Chile. In these projects, Elemental seeks to create contemporary housing for working class people that is sufficiently “open” for the homeowners to repair and extend their homes themselves, disburdening them of some of the economic stressors that come with contemporary homeownership, freeing them to take control of their own space, and doing so without compromising a progressive aesthetic and technological agenda.<sup>7</sup> This is done in large part by paying close attention to the building technologies employed in the initial construction. Aravena’s team manipulates and selectively adapts their culture’s common building technologies to ensure that their buildings’ “stuff” remains open and accessible to the homeowners without compromising the virtues of those technologies or deviating far from a coherent system of interchangeable parts.

<sup>6</sup> Illich. p.73

<sup>7</sup> Elemental. “ABC of Incremental Housing”.



Made of Such Material as is Readily Available, Easily Manipulated and Familiar  
Takes Advantage of Simple Modular Construction Systems for Ease of Repair and Expansion<sup>K</sup>

## Criterion 2: Conceptual Accessibility

Elemental's housing units have a strong diagrammatic quality at multiple scales that makes clear what can be modified and how. At the community level, areas are left open for public programs to develop over time. The massing of individual buildings or units indicate paths of potential future growth while construction details provide clues as to how new fabric can interface with old. Units are generally presented to new occupants as partially complete with the idea of driving personal investment by users from day one: a push towards conviviality on ground prepared for its growth.

Furthermore, the construction of each of Elemental's new developments is paralleled in time by classes for and seminars with the community that bring individuals on site, introduce them to both the conceptual and physical elements of their future homes and provide guidance and support for the initial stages of resident take-over and expansion, empowering residents to plan and construct their own environment as they see fit.



Strives for Diagrammatic Clarity  
Invests in Homeowner Education<sup>L</sup>

## Criterion 3: Regulatory Accessibility

As part of community meetings, Elemental begins the process of handing over conceptual control to residents. Many of the seminars take the form of visioning sessions in which future residents explore their own desires for the project's outcome before it is fully realized. While facilitated by the architectural team, this is ultimately the first step in a relinquishing of control by designer and developer alike. By the end of construction, residents are equipped not just with knowledge of how to maintain, modify and repair the technologies of their new homes but with robust agency that allows them to do so as they see fit within the bounds of the broader community.

At a larger scale, Elemental recently released to the world all of the construction drawings for four of their housing projects.<sup>8</sup> This release in and of itself speaks to the desire to level building culture – It says, “you too can build this”. Of greater significance is the fact that the drawings were released not as locked PDFs but as CAD files, effectively saying – “you too can change this”. You can rewrite the code, both on the ground by understanding and digging into your existing Elemental house, and in the computer by understanding and digging into the Elemental house as a paradigm.



Promotes Independent Problem-Solving  
and Self-Expression<sup>M</sup>

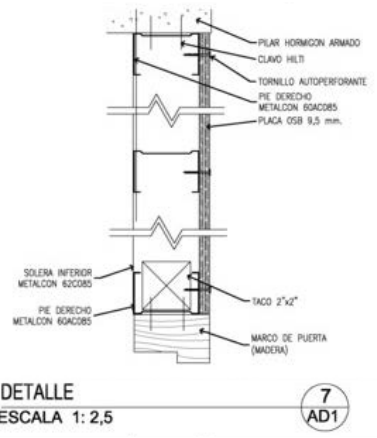
<sup>8</sup> Elemental.

<sup>K</sup> Aravena. *ELEMENTAL: Incremental Housing and Participatory Design Manual*. p. 428.

<sup>L</sup> Aravena. p. 125.

<sup>M</sup> Aravena. p. 125.

As Elemental foregrounds new ideas about and technology for housing, they are quick to make these ideas open and easily disseminable. There is no sense that one needs permission or guidance to take on the repair of one's own home. Elemental actively seeks out the most accessible of contemporary building technologies and ideologies and places them at the heart of real communities for anyone to pick up. Digging into the drawings we find that much of the architecture is made up of familiar, generic elements, and that even new technologies, where they have been introduced for their boost to quality of life, are treated as interchangeable elements of open systems, not black boxes sealed by intellectual property laws or stickers reading "VOID IF BROKEN".



### Criterion 4: Price Accessibility

Elemental's "progressive housing" takes advantage of many of the cheapest building technologies in Latin America: cinder blocks, dimensional lumber, corrugated sheet metal, PVC piping. Intentionally, these are material systems that are easy to procure and do not require costly expertise from outside of the community to manipulate. The famous "half house" element of the initiative ensures that whatever capital investment is made in the initial construction goes towards providing higher quality necessities: plumbing, heating, bathroom and kitchen fixtures that are resilient and will not need frequent replacement. Above all, the goal of Elemental's progressive housing is to bestow upon many of their nation's poorest the personal liberties that promote community well-being without loading them with additional debt. Indeed, it frees these people to generate value for themselves through their personal labor, independent of the need for capital or contracted assistance. This gesture of offering on the part of the architects – drawings, houses – represents simultaneously a deep appreciation for the economics and culture on which home repair has traditionally stood while demonstrating methods of incorporating new technologies, planning processes and regulatory frameworks into that culture; a transmutation of the successes of Latin America's informal favelas, rather than an outright replacement of them by industrial alternatives; a different, a more fair, a more viable, a better way forward.

Provides Free and Broad Access to the "Base Code"<sup>N</sup>



36 m<sup>2</sup>  
 Si la primera mitad de la casa costó  
 if the first half of the house cost was  
 US\$7,500



36 m<sup>2</sup> + 36 m<sup>2</sup> = 72 m<sup>2</sup>  
 Si se repite (se repite)  
 and the second half  
 if value from self-repairs had  
 the final value is more than  
 US\$1,000 = US\$20,000

Allows Users to Save Through Self-Repair and Self-Modification, Generating Added Value for Themselves Through Personal Energy.<sup>0</sup>

We who design and build homes in this country must pick up this mantle from our Chilean colleagues. Illich reminds us that, in the end, "progress should mean growing competence in self-care rather than growing dependence."<sup>9</sup> As architects, we bear the responsibility for "devis[ing] tools and tool systems that optimize the balance of life, thereby maximizing liberty for all."<sup>10</sup> Let's produce designs that are simple, flexible and accessible so that we may sow competence and confidence in our clients and neighbors in years ahead. Let's build convivial homes so that the people who will live with our designs can engage with them meaningfully and make them their own through a resurgent culture of self-care; self-repair.

<sup>9</sup> Illich, p. 35.

<sup>10</sup> Illich, p. 77.

<sup>N</sup> Elemental.

<sup>0</sup> Aravena. p. 146.



## Critical Sources:

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