

# The Role of the Architect in the Age of Open Source

You never change by fighting the existing reality. To change something, build a new model that makes the existing model obsolete. — R. Buckminster Fuller

## WE ARE LIVING IN A REVOLUTIONARY ERA.

In 2012, *The Economist* released an article about “The Third Industrial Revolution,”<sup>1</sup> one marked by the shift from industrial to digital forms of production.

MIT professor Neil Gershenfeld calls it *The Revolution on Your Desktop*. In the near future, he writes, personal 3D printers will be widely accessible, giving ordinary people the ability to print the parts they need to fix their broken machines, to produce custom furniture, or to make virtually anything else they can imagine, including the components of the printer itself.<sup>2</sup> Nor does there seem to be a limit to the scale of the change. Researchers at the firm Gramazio Kohler have experimented with a modular approach to building construction that employs robotic arms, and Joris Laarman is honing the art of architectural-scale 3D printing.

This revolution is changing the nature of production in a significant way. Joseph Grima, former editor of *Domus* magazine, claims we are entering a period of Adhocracy, a shift away from mass production and towards infinitely unique and customizable products, a democratization of the process of production rather than of product.<sup>3</sup>

Another parallel development which is changing the rules of the game is the mobilization of knowledge through the global online community, which provides channels for sharing designs and training, often for free. This is a natural consequence of the democratization of information that began with the advent of the internet.

The increasingly collaborative approach to sharing information, coupled with the accessibility of new technology, such as 3D printers, CNC machines and laser cutters, has given the general public the ability to generate and straightforwardly translate designs into finished products, giving millions access to a process that has in the last century been restricted to a limited number of designers and manufacturers.

In order to reflect on the implications of this shift, particularly for the fields of architecture and design, I would like to consider specific factors which have played a central role in these developments.

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### **DESIGN MOTIVATIONS: FINANCIAL, EMOTIONAL, POLITICAL**

Let us look at some of the basic motivations that drive design and innovation. Each of these areas has witnessed recent changes signaling a more general independence both from the conventional economy and from professionals, suggesting that architects must reconsider their role in the market.

Although the need for products that enhance our everyday lives is ever-present, the mass production of objects that followed the industrial revolution meant that it was generally cheaper, easier and faster to purchase products than to make them oneself. By contrast, as the materials and tools of production (such as 3D printers) become cheaper, the public will opt increasingly to make their own unique products.

In addition to the financial motive, Richard Sennett<sup>4</sup> and Matthew Crawford<sup>5</sup> identify the feeling of fulfillment that comes from involvement in the act of making. We as humans are emotionally motivated to use our hands to fashion tangible objects. This is especially true today, when we spend much of our time poring over computer data rather than working with our hands. Rachel Maines argues that this lost connection to making results in the hedonization of labour, where tasks that were once treated as work have been transformed into pleasure-oriented activities.<sup>6</sup>

Furthermore, there is the political motive. Matt Ratto and Megan Boler speak of the return to DIY as a way of gaining independence from the market, arguing that it is a form of grass-roots democracy.<sup>7</sup> They cite Fleur Mann's idea of "Maktivism," which brings together DIY (Do-It-Yourself) with DIT (Do-It-Together)—asserting independence from the corporate model, but also emphasizing the value of collaboration.<sup>8</sup>

### **ACCESS TO IDEAS, INFORMATION AND SKILLS**

The internet has given the public access to vast amounts of shared ideas and information as well as to online training and tutorials to develop knowledge and skills. Many frameworks have been developed to facilitate sharing online.

Perhaps the most well-known example of this is a program called GNU Linux, developed by Richard Stallman and Linus Torvald out of frustration with proprietary software. They believed that software should be freely-available to others for adapting and improving upon, and thus dictated that Linux would operate under the principle of Copyleft (as distinguished from *copyright*). Copyleft software is freely-available, with the stipulation that anything developed using Copyleft software must also be Copyleft.

Those who defend the belief that knowledge is inherently intended to be shared have been called Information Exceptionalists.<sup>9</sup> They claim that information is a "Non-Rivalrous Resource".<sup>10 11</sup> Licenses like Free Software and the Creative Commons carefully define the terms of use for shared knowledge online in order to prevent abuse of the system. These then substitute for traditional copyright. Through active participation, the information can be filtered and accredited.<sup>12</sup>

The sharing of skills and knowhow has been a direct result of the new digital and maker communities. Wiki-how and *MAKE Magazine* offer online tutorials to make pretty much anything. YouTube videos can demonstrate the process from start to completion of undertaking almost any project. Hackerspaces and makerspaces offer regular workshops to share the skill-based knowledge that exists within the community.

### **ACCESS TO RESOURCES: PHYSICAL AND FINANCIAL**

Makerspaces such as Artisan's Asylum in Boston have emerged as an offshoot of hackerspaces as a way of pooling resources to gain access to expensive machines like laser cutters and 3D printers. In the makerspace model, membership usually allows one both to use the machines and to attend workshops. Since technologies are constantly improving, becoming cheaper and more versatile, more and more people have access to these tools every day.

Although the implications of freely-shared designs in the field of architecture are not yet fully explored, there have been initial forays into open source design such as Architecture for Humanity, Open Desk and WikiHouse. Architecture for Humanity's mandate is to share plans that can be implemented by anyone across the globe. Open Desk offers the public free designs as a way of attracting attention to their work. WikiHouse is a collaborative online platform that seeks to develop sustainable architectural designs. Although the existing examples are small in scale, there is no limit in sight.

#### **FUTURE SCENARIOS: ADVANTAGES, DANGERS**

Scholars argue that because these communities generally operate independently of the market, they give many more people the opportunity to participate in design and production, thereby empowering the individual and engendering equal access. This phenomenon also mobilizes a massive knowledge base, allowing for unprecedented levels of collaboration.

...digital knowledge communities bring together local and transnational communities of practice, bypassing the market, the state and international regulatory mechanisms.... [They also offer] new modalities for participatory social production based on collaborative, commons-located and peer-to-peer networks, bypassing traditional hierarchies of knowledge and cultural production.<sup>13</sup>

Since global collaboration draws upon a wide range of input, it can be innovative, adaptable, and potentially of a higher quality than what an individual architect or designer could achieve working independently.

On the other hand, Phillip Kalantzis-Cope argues we must be cognizant that designs and products that develop a large user base can also take a stranglehold on the market in the hands of what he calls the "Vectoralist Class," who seek to control the channels through which freely-available information moves.<sup>14</sup> Nothing prevents Google, for instance, from offering open source services as a way of leveraging market dominance.

There's also a central question that needs to be addressed regarding regulation and governance at the global scale. The digital community champions universal accessibility, but does not evaluate its ends or uphold any specific ethical principles. It can offer no serious critique, for example, of Cody Wilson's 3D-printable gun. Open source designs can be produced by a large number of people worldwide, yet on this scale they become almost impossible to regulate.

Another danger, albeit not an ethical one, is the implementation of shared designs in a generic manner without properly accounting for context, such as the Sears Catalogue Home.

Regardless of these dangers, the transformation of design is going to proceed, and is going to have an impact on the way architecture is practiced.

#### **FUTURE SCENARIOS: IMPLICATIONS FOR THE PRACTICE OF ARCHITECTURE**

As the consumer and the producer become more closely identified,<sup>15</sup> there's a growing independence from professionals. Technologies are becoming more user-friendly (with more subtly defined parameters). The technology before us, including parametric design tools and building information modeling, could easily allow for the development of algorithms whereby the user inputs information regarding climate, site, materials and design preferences, and the software generates a complete set of plans for the optimal building. Given this context, what are some possible future scenarios for architecture and design?

A portion of the population is likely to find free designs online and implement them without concern for context, because their main concerns are economic. The public will naturally be drawn to freely-available designs for their cost-effectiveness. Others will find open source designs, such as those at WikiHouse, which they then adapt and customize to suit their

individual needs and contexts. Architects may be the ones to develop, alongside software engineers, design software that allows amateurs to design their own buildings. Or perhaps, bleak as it sounds, architects will be the ones offering tech-support and supervising quality control. Fortunately for architects, there will likely always be a segment of the population who are willing to hire them to produce designs that are totally original and proprietary, but the digital revolution will make this a rarer occurrence.

Architecture must recognize that the proprietary approach is not sustainable in this new context. The profession must adopt a more collaborative way of working and must clearly articulate its unique ability to synthesize existing ideas and to act as a regulating body if it wishes to remain relevant in the age of Open Source.

## ENDNOTES

1. The Economist, "The Third Industrial Revolution," in *The Economist*, April 21, 2012.
2. Neil A. Gershenfeld, Fab: *The Coming Revolution on Your Desktop—from Personal Computers to Personal Fabrication* (New York: Basic Books, 2005).
3. Marcus Fairs, "Joseph Grima on Adhocracy at Istanbul Design Biennial," in *Dezeen Magazine*, October 15, 2012.
4. Richard Sennett, *The Craftsman* (New Haven: Yale University Press, 2008).
5. Matthew Crawford, *Shop Class as Soulcraft: An Inquiry into the Value of Work* (London: Penguin Press, 2009).
6. Rachel Maines, *Hedonizing Technologies: Paths to Pleasure in Hobbies and Leisure*. (Baltimore: The Johns Hopkins University Press, 2009).
7. Matt Ratto and Megan Boler (eds), *DIY Citizenship: Critical Making and Social Media* (Cambridge: MIT Press, 2014): 5.
8. *Ibid.*, 3.
9. Phillip Kalantzis-Cope and Karim Gherab-Martin, *Emerging Digital Spaces in Contemporary Society: Properties of Technology* (New York: Palgrave MacMillan, 2010): 134-136.
10. *Ibid.*, 135.
11. It is worth noting that the commons in the digital world does not suffer the same tragedy of the commons in the world of tangible goods. Ideas are not limited resources.
12. Yochai Benkler in Kalantzis-Cope and Gherab-Martin, 135.
13. Kalantzis-Cope and Gherab-Martin, 132.
14. McKenzie Wark in Kalantzis-Cope and Gherab-Martin, 139.
15. Alvin Toffler, *The Third Wave* (New York: Bantam Books, 1981).