

CRAFT IN THE DIGITAL AGE

Glenn Adamson

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Craft has had many self-proclaimed adversaries. In the period of the industrial revolution, the whole notion of making things by hand came to be seen as antiquated, slow and inefficient. Craft was something to transcend, not to value. In more recent years, it has been pigeonholed as traditional – an antithesis to the exploratory and conceptual power of fine art and progressive design. And craft can also be seen pejoratively because of its associations with amateurism; professionals make things properly, instead of the more modest tools of the hobbyist.

I have tried to show in my books *The Invention of Craft* (2013) and *Thinking Through Craft* (2007) that oppositions like these are largely misleading. Craft is often considered in opposition to other categories (such as industry and art), but in fact these categories are dependent on individual workmanship, in ways that often go unacknowledged. Think of the makers of machine tools, the fabricators who realise sculptures. Without these skilled artisans, we would have had no

industrial revolution at all, and the contemporary art world would be a much different, much more marginal affair.

The latest instance of this systematic underestimation of craft is our current enthusiasm for the 'digital' in all its forms. Many consider the digital to be the latest enemy of craft – another nail in an all-too-human body of knowledge. This has motivated an essentialist romanticism in certain quarters, itself reminiscent of the late 1960s, when the countercultural instinct inspired many to go 'back to the land'. Echoes of that time can be seen at many different scales in contemporary culture, from the rhetoric of DIY 'craftivists' to highly capitalised marketing departments, which promote corporate brands as if they were authentically grounded in the handmade. This largely symbolic rehabilitation of craft does not, I think, capture the true relationship between the analogue and artisanal, any more than computer-driven tools have fundamentally altered

what it is to be a maker. The transformations are not so tangible as that, but they are much more profound.

Visit an art and design school with an orientation toward industry – Art Center College of Design in Los Angeles, for example, or the College of Creative Studies in Detroit – and you will see students being trained to produce vehicles, animated films, fashion, graphics and architecture. Eventually, all these things will be realised using digital tools, including rendering software, robotics and other forms of automation. The training, however, remains grounded in the typical materials of the craft model shop: pencil and paper, cardboard and tape, knife and clay.

As these students enter the workforce, many will continue to employ putatively old-fashioned techniques as a means of ideation. Even if they don't, their prior experience of making by hand will continue to inform their sense of the possible. Many leading artists and designers – Jonathan Ive, Thomas Heatherwick and Ron Arad, to name just three – have attested to the ongoing importance of impromptu analogue sketching (both 2D and 3D) to their practice. No matter how powerful your computer, the circuit between mind and hand is still the most potent in creative practice.

Partisans for craft – I count myself among them – may be tempted to simply celebrate the relevance of hand skill in the context of innovation. We are relieved (possibly even pleasantly surprised) to find that artisanal know-how still has a role to play in innovation. Yet this is not going far enough. We should not simply see craft as the static ground from which the digital emerges. Instead, we should understand the interaction between the analogue and the digital as recursive, with each array of techniques decisively inflecting the other.

This process of inflection is still at an early and exciting stage of maturation. We are still a few years off from the moment when the 'digital natives', kids who cannot remember a time before the Internet, will graduate from college. Here and there one hears anecdotes about this coming generation: infants who swipe fruitlessly at magazine covers in expectation of changing the image; children confounded by antique artefacts like typewriters and film cameras; teens with hyper-agile thumbs, trained by years of texting. These shifts run deep, and cannot help but transform the way that people use their brains and hands alike.

Some of the evidence is already in. Most obviously, perhaps, the information revolution has lowered barriers to making, and has done so with astonishing speed. At one point in history, craft procedures were secrets, or 'mysteries', closely

guarded by protectionist guilds. These firewalls of knowledge collapsed in the 19th century, as traditional forms of labour organisation gave way to the modern unions. Information was now a publicly traded resource, and how-to literature, trade manuals and other publications flooded the market. It remained inherently difficult to learn complex skills without a mentor however, on the basis of text and static images alone, so apprenticeships of various kinds still were necessary.

Today, anyone can apprentice in any trade at any time. If you want to learn how to weave a basket, sharpen a blade, rebuild a motor or operate a laser cutter, YouTube will provide the basics, and distance learning courses can fill in the rest. The increase in access doesn't stop there: not only can you quickly discover the existence of highly specific tools and materials; you can also have them delivered to you, probably overnight. Open access works on the distribution end too. Via mass distribution sites, sellers can also find buyers much more readily, making new forms of business possible (even if the true viability of such micro-manufacturing remains to be determined). From this perspective, digital tools such as 3D printers and CNC routers – often singled out for their paradigm-shifting impact on ways of making – are actually only one of the many digital expansions to the contemporary maker's toolkit, and by no means the most important.

The digital landscape has altered and expanded practice at still deeper levels. I use the word 'deep' here advisedly, for there is a popular prejudice that the Internet fosters a broad but superficial relationship to information. Think of Google image search, which instantly serves up a profusion of pictures – so profuse that it might seem to cover the full range of a term's visual correlates, when in fact the yield is wafer-thin; the algorithmic equivalent of skimming a book and coming away with its chapter titles only. The speed and power of this omnipresent tool cannot be denied however, particularly for those with a large visual appetite. Digital experience fuels the imaginative storehouse of the maker, encouraging rapid-fire connection, leaps from one data point to another.

My sense, then, is that the prejudice against Internet-based knowledge is unfair. Yes, undergraduates at work on term papers often begin and end their research phase with a Google. But just as online research tools have vastly extended the analytic power of historians and scientists, so too artists and designers are benefitting from a sphere of reference that is for all practical purposes infinite.

'Digital experience fuels the imaginative storehouse of the maker, encouraging rapid-fire connection.'

This does not necessarily need to be a systematic process. Artists have always flicked through illustrations; the difference is that now, they can do so at exponentially higher rates, with a correspondingly high incidence of serendipitous encounter.

Digital experience and tangible making have a dramatic and ongoing impact on one another when it comes to aesthetics, too. The aforementioned Jonathan Ive is well known for his dislike of 'skeumorphs', denotative holdovers of previous technologies (like the shutter sound that you hear from your iPhone, or the turning pages of early Macintosh displays). Yet he speaks forcefully of the 'resurgence of the idea of craft', in the sense of qualitative and careful regard for materials and processes: *'We're surrounded by anonymous, poorly made objects. It's tempting to think it's because the people who use them don't care - just like the people who make them. But what we've shown is that people do care. It's not just about aesthetics. They care about things that are thoughtfully conceived and well-made...It's a demonstration against thoughtlessness and carelessness'*.

The converse is also true: the digital has changed the way that analogue makers approach their work. Sometimes this is explicit, as when weavers like Lia Cook use the jacquard loom to address effects such as pixillation. (The jacquard, of course, was a technological precursor to the computer, so she is to some extent simply circling back to the origins of the digital.) In other cases, the characteristic features of digital form - stretched distortion, filtered colour and backlighting - migrate into analogue design as if unconsciously. Examples range widely; from the dyed fabrics used by the fashion duo Rodarte (which resemble the painterly effects of Photoshop) to the clip-art ceramics of Robert Dawson, to the slumping, dynamic glass forms of Simon Klenell.

Of all the aesthetic effects inspired by the digital, perhaps the most significant is what we today call the 'mash up', that is, the conflation and integration of unlike elements. Already in the 1980s - when the Internet was only a glimmer on the horizon - postmodernist techniques anticipated the possibilities of 'search'. Cut-and-paste graphics, eclecticism, airbrushing, 'smash joints' between disparate motifs, and sampling are all examples of digital behaviours

avant la lettre, even though all of these were achieved by hand. (This premonitory aspect of creative practice can be considered a sort of prototyping in its own right, perhaps.) Fast-forward 30 years to the present, and we can see that these postmodern tactics, initially associated with the subcultural and theoretical margins, have become mainstream. The skimming-stone-like quality that used to occur in the object and the image now happens at the level of professional identity. Painting and pottery, architecture and acting, fashion and furniture - these categories are now way-stations, not vocations, to be occupied and abandoned at will.

From a craft perspective, the question raised by such transient, cross-disciplinary activity is how one maintains skill when shuttling from one *métier* to another. It's all well and good to say that the contemporary artist can be making a video on one day, a sculpture the next, a pot the day after that, then curate an exhibition, and design an associated publication to document the lot. It's another thing for each of these individual components to be executed thoughtfully, masterfully. Here we reach the real crux of what it means to be a digital maker. It's not just a question of new tools or even new aesthetics, but one of perspective: we need to think about horizons of awareness and expectation.

On the one hand, as I've argued, the digital has made both skill and useful information more available than ever. On the other, it has encouraged habits of mind that militate against specialism; and specialism, now as ever, is absolutely necessary to the development of expertise. At art schools everywhere, this tension lies at the heart of questions about how we will educate the current generation of students, and the 'digital natives' to come. To grasp the true impact of the digital on making, we need to think both laterally and in depth, as good makers themselves know how to do. Our horizons get ever broader, but that makes it all the more important to retain respect for artistic commitment at every level.

FOOTNOTE

1. Ivo J. 'The Man Behind Apple' in the Sunday Times, March 16, 2008.

ARCHITECTURE: DIGITAL SPECULATION AND PHYSICAL PRACTICE

Mark Foster Gage

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There are equal quantities of irony and prescience in the fact that the term 'digital' emerges from the Latin root *digitus*, meaning finger or toe. Fingers are, after all, the most analogue of instruments – surely nowhere near as interesting as the parametrically coded world of 3D printed buildings that architecture currently promises to a world of eager, future-gazing consumers? In the hype of the 21st century's digitally progressive everything, the analogue charms of fingers have, like sinners after some apocalyptic digital rapture, been left behind.

It turns out, however, that fingers are pretty incredible things, deserving at least a cursory obituary before we move our discussion back to the digital. The processes involved in moving your fingers to access this particular page, for instance, is a process so complex, and involving such vast quantities of information in the form of sensory feedback, textural processing, pressure calculations and logistics of

position in space, that it is impossible to accurately reproduce using all of the world's current digital prowess and robotic intelligence. In fact, our current efforts at reproducing human muscle movement using digital and robotic technologies, however important and brilliant, usually result in stumbling, drunken automatons that can barely walk, much less navigate the delicate page of a book. That is to say, as far as complexity, efficiency, control and nuance of movement, your finger can still give the digital...well...the finger. So why does the digital hold such allure to architects? And why does the promise of 'digital fabrication' still continue, decades after its invention, to prompt wild speculations on what the future of the profession will bring?

There can be no doubt that architecture, as a profession, has had an explosive couple of decades of technological advances, and that these advances have opened up new possibilities for what

can be produced; formally or otherwise. As such, architecture can be partially forgiven for making the accompanying sweeping promises of a future vastly reconfigured by these innovations. The problem with the continual onslaught of such promises is that the digital has spawned not only a wealth of new and fantastic tools, but an entire genre of architectural fortune tellers that seem content to merely make futuristic claims on the digital's behalf (as opposed to doing the actual productive research that might turn such a future into a real present). This is unfortunate, as it places architecture's successes 'just around the corner', leaving us with a rather unattended architectural present.

We have all heard the claims: all buildings will soon be 3D printed on site! Social and political interconnectivity through Parametricism! Cities made of mushrooms are the future! At a certain point, however, it might be worth placing a finger on the pause button of speculative claims, for the sake of an increasingly desperate present, and take a sensationalism-free assessment of the digital and what it can do for us, for humanity, now.

Fortune telling is fun. After all, who doesn't want to know what lottery ticket number to choose, which romantic relationships to pursue, or what colour your aura is when Sagittarius is rising. But as a profession, we should have matured enough to know that while speculation is one of the most exciting parts of the our discipline, it should be used in the service of a progressive present, instead of for the production of a sci-fi discourse reliant on sexy narratives and scant production. The point being that digital fabrication, robotic movement, 3D and '4D' printing, the development of programmable graphemes and promises of biomimetic computation are neither 'over' (having been published twice) nor will any one of them be solely responsible for architecture's future.

The truth is, an emphasis on such narratives shift architecture from a discipline of the physical to a discipline of the verbal. As a profession, our speculations have become exciting enough to eclipse our current reality, and our tools have become so sophisticated at allowing us to visualise just about anything that we are beginning to mistake storytelling bolstered by polished renderings or cheap lobby installations for actual research and actual, physical architecture.

As far as speculations on what digital technology will enable, the ugly truth is the digital has been most influential not in the creative or design aspects of architecture, but its financial machinations - its tracking, cost estimating, product procurement and efficiencies of time-saving assembly. For all of the promise of 3D printing, robotic stacking and biological computation, it's been the Excel spreadsheet and product-linked BIM model that are the true legacy of

the digital in contemporary practice. And so we see a dissonance between the promise of digital dreams foretold by architectural futurists who produce effervescent words sprinkled with the occasional museum object, and the actual use of the digital: in the form of vast spreadsheets that track the cost and placement of every brick.

The future of the profession lies at neither extreme. Architecture's actual future needs to be a fusion of these two trajectories into a single profession that neither digs its heels into the sand nor, like Icarus, flies too close to an unreachable sun. Digital technologies are not only the spur to both of these strains of practice - the bean counting and the speculative - but also provide a common language that holds the only hope for their possible remarriage.

Architecture is among the most complex and resource-intensive endeavours of humankind. It is complicated beyond the ability for any single person to understand its true extent as a discipline, or as a singular endeavour. It involves far-reaching calculations of material, access, weight, transportation, debt, engineering, assembly, waste, regulation, insurance, expectations of profit, identity, longevity, safety and maintenance, all engaged in different capacities by individuals, families, communities, religions, unions, contractors, bankers, corporations, lawyers, politicians, speculators, inhabitants, governments and descendants.

For any single technology or method of making to claim to replace the entirety of these complexities is unfathomably naive. Architecture is, and always has been, the fusing together of countless materials and systems in the production of seemingly monolithic wholes - historically known as 'buildings' (despite the fashionable embarrassment the profession currently holds for that particular term). Instead of continually selling speculative narratives, or becoming product-pushing service providers, now is the time for architects to put the digital tools at our disposal towards more research-based, progressive and achievable ends.

We still have our analogue fingers, and have added a wealth of new digital tools - more digits, if you will - to our trade. We need to introduce the elitist, academic speculators to the efficient, if boring, BIM builders. Their courtship depends on the recognition that what unites them is the common language of the digital. The future of architecture - if not our entire environment as a species - depends on their offspring. A rekindling of this romance is not a compromise, but will likely produce a stranger world than we currently have, or can possibly imagine. To aim for anything less, however, will all but guarantee that our influence in the world, and therefore our relevance, will continue to slip through both our digits and fingers.

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