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Digital Risk, Materialization of Digital Media

To practice architecture today is to reach across centuries of disciplinary divisions that have removed us from material. It is not surprising that many celebrated contemporary projects are clearly derived by shaping a visual experience. The tactile and the haptic have been degraded in favor of productivity technology and unlimited virtual iterations. Recent developments in digital fabrication applications have opened new opportunities for architects to reengage with tools and materials. For architects that have leveraged this technology there still exists digital protections that do less for the value of their outcomes and more for their industrialized efficiently.

When one pushes for the optical and practices only the theoretical component of design, it is done at the expense of matter in space (Adamson, 2007). While computers can simulate architectural space with efficiency, they do not account for the human sensory feedback required to craft material. Malcom McCullough has asserted in an impressive argument that the operation of digital technology defines a new dematerialized craft (McCullough, 1996). The tactile shaping of material was viewed to have a parallel digital equal in computer clicks and bits. McCullough maintains that the act of craft can occur entirely virtually regardless if the work results in a physical artifact. Although widely accepted within the discipline of architecture, McCullough's assertion negates the inherent resistance provided by material and the productive failure it induces in making.

In a pre-digital context, David Pye clarified related distinctions between craft and Industry by defining the craftsmanship of risk and the craftsmanship of certainty (Pye, 1968). The craftsmanship of risk achieves quality through a calculated risk of personal skill, while the craftsmanship of certainty requires preplanning and careful mechanical implementation. Digital media described by McCullough further mitigates what Pye defines as risk by subjugating material awareness with safe digital simulation.

This paper will engage both the digital and the analog through a case study that provides insights into the role of digital tools that embraces both material risk and digital control. The digital tool is based on an open-source delta 3D printer configured to print ceramic clay (figure 01). The principle that guided the tool's design was to have distinct tasks relegated to the computer and to the human hand (figure 02). The 3D printer's design intentionally allows risk, it embraces failure and negates standardization. The craftsperson is not simply an "operator" of a computer tool but in a risky negotiation between the material and the digital.

There is value in looking closely at dematerialized and traditional craft not only through the lens of outcomes and their quality but how they negotiate the benefits of risk. The insights of both Pye and McCullough are now converging in a post-digital context that raise new questions about how risk is defined and used in the creation of craft objects. The case study profiled will suggest that digital craft need not subjugate material knowledge and will translate how digital risk can be used to extend our understanding of craft (figure 03).