# WHO ALREADY DOES THIS BETTER? MASS PRODUCTION + CUSTOMIZATION

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A general reluctance to embrace technology is eponymous with the Luddites, or the "Machine-Breakers" to which they were commonly referred, and their early 19th century protestations. In the late 1811's, traditional weavers objected to the implementation of larger more efficient looms. This technological breakthrough revolutionized the weaving industry. Less skilled and fewer workers could produce more clothe than previously. These new machines, consequentially, in conjunction with the economical effects of the War of 1812, placed a heavy burden upon the traditional weavers who feared for their livelihoods. As Malcolm I. Thomis in his book, *The Luddites Machine-Breaking in Regency England*, demonstrates the socio and political complexities of this era necessitate a more complete understanding of the events that occurred during these tumultuous times. Furthermore, it is important to understand that the weavers' hostility towards new technologies and machinery was not a unique incident but had occurred time and time again throughout history.[1] These specific outbursts in 19th century England, however, demonstrate that the implementation of new technologies has a greater impact than merely lessening the burden of work. From a purely capitalist paradigm the efficiency developed by updated technologies is justified, but from an ethical stance their benefits are perhaps questionable. The introduction of any new technological improvement demands a more critical examination of all consequences experienced - intended and unintended.

The introduction of any new technology is often accompanied with a moral agenda, even when not emphatically stated. Technology promises to "improve" our lives, to make it better: without perhaps taking into account other possible consequences. Carl Norden, an engineer who immigrated to America in 1904, developed a bombsight that would greatly improve the accuracy of bombs dropped from airplanes. Being a devote Christian, he felt that his invention would do the greatest amount of good because it will reduce the number of the civilian deaths. In the end, however, the Norden Mark XV Bombsight was not as effective as hoped. It was a complex apparatus for the bombardier to operate and there were far too many variables for the analogue device to consistently compute. The sight was ultimately employed to drop the first atomic bomb on Hiroshima on August 6 1945 resulting in the death of 200,000 people. Despite all his aspirations to eliminate civilian casualties his invention did not reduce suffering in the war. Norden had, paradoxically, developed a precise tool whose application in the end did not require precision: that is to say, an atomic bomb need not be very accurate to be effective.

While the advent of any new technology brings with it a host of innovative possibilities, it also brings to bear other responsibilities. Far too often, efficiency becomes technology's justification. The issues at hand are not only how effective the new technology may be, they should question how the new technology is applied or whether or not it should be used it at all. Moral and ethical considerations are often not accounted for: they become secondary or tertiary considerations. A moral compass must be employed in guiding the application of any new technological improvement.

Technological innovations are valued for their ability to *better* perform: be that in terms of its timesaving ability, accuracy or efficiency. There are numerous examples of employing time saving devices to gain economic advantages, but as 14th century Benediction Monks have demonstrated, more efficient work habits offer other rewards – the freeing up of time to pursue other enterprises. These monasteries reveal this adaptation of technology and mechanization where an over-all rationalization of an entire technological process was valued and implemented.[2] Shaker communities also embraced technological innovations (from both outside their communities and within) in order to devote more time to spiritual activities. They were quick to utilize new technologies such as clothes washers and automobiles to more efficiently complete the burden of daily work. "Much as they valued work as an expression of worship, they sought to streamline work whenever possible."[3]

The architectural profession (as well as academia) has benefited from technological innovations. These advancements, be they the Mayline replacing the t-square or the computer replacing the Mayline, arguably have allowed designers to become more facile in their ability to develop, explore and ultimately express their design intentions. The academic community, however, has been divided in regards to how these new technologies (specifically the computer) should be introduced in design studios and what their specific roles in educating students should be. The issues at hand, however, are actually quite straightforward. Rather than supplanting traditional means of learning and designing (*manual* with *digital* means of representation for example) these new technological innovations should have been seen as opportunities to add to existing pedagogical agendas.

The advancement of the computer from a purely representational tool to one that can now also fabricate has become the center of

yet another similar discourse. As designers begin to explore the new range of possibilities and opportunities that this burgeoning technology offers, the same mistakes previously made are repeated. Rather than understanding how the building community could benefit from the addition of this exciting new means, they are lauded as a revolution in the building industry: indiscriminately superseding and replacing traditional methods.

As the responsibility of detailing a building was transferred from the craftsman to the architect, the role of and meaning of the detail also changed. In the Beaux Art tradition, the designer could rely on the skill of the craftsman to develop and fabricate a building's details. The character of the building would be inferred by the *analytique* developed by the architect, but this graphic representation served merely as a guide. It was "simply the source for the understanding of the ordering role of a single detail."[4] But in contemporary architectural practices, the architect supplants the traditional role of the craftsman, where the *actual* detail (the built one) is developed from the *virtual* one (the drawn one). Drafting replaced crafting. Additionally, this transfer of duties of conception to construction took from the craftsman the ability to interpret. The detail is to be fabricated as indicated by the architect's intensions (be they graphic representation or built mock-ups): eradicating interpretation, making it unnecessary (and in most cases undesirable).

To further reduce any chance of misinterpretation, parametric modeling, rapid prototyping and other means of digital fabrication have become prominent tools of the trade. Digital technologies, which were once mostly effective as design and drafting tools have now ushered in new methods of making manifest the architect's intentions. These new innovations allow the designer to further supplant the traditional role of the craftsperson. All possibility of misinterpreting is eliminated when the transfer and translation of information is conducted between machine-to-machine rather than person-to-person. While improved efficiencies have obvious economical advantages, they do not necessarily address a more critical concern: that is, it does not suggest inherently how these new technologies can be employed to communicate these new processes. If new methodologies cannot be conveyed in the built forms they produce then they fail to capitalize on any opportunity to participate in a larger dialogue.

Architects, such as Edward Ford, have begun to suggest of the possibility of an expanded role that details could possess. While other designers have proclaimed that the detail is dead, Ford avers that the detail is still a necessary element of architecture. "Le Corbusier, Auguste Perret, Philip Johnson and Paul Rudolph all declared that details did not exist. Many architects of the contemporary avant-garde agree. Rem Koolhaas has proclaimed his intention to make detail-less architecture; Ben van Berkel has spoken of their exclusion; and Peter Cook, Zaha Hadid and Greg Lynn have all described the detail as a fetish."[5] This reduced role of the detail is for Ford and author Marco Frascari a lost opportunity. For them, the detail plays a pivotal role in not only how it performs but also more importantly how it conveys. Frascari in his seminal article *The Tell-the-Tale Detail*, addresses this expanded role of the detail. He argues that the success of the detail is not only in its performative abilities (to *construct – logos of techne*) but also in its ability to reveal another order (to *construe – techne of logos*). Martin Heidegger has addressed a similar notion regarding the role of technology. He offers, "what is decisive in techne does not lie at all in making and manipulating nor in the using of means but rather in… revealing. It is as revealing and not as manufacturing that techne is bringing forth."[6]

Conventionally, the detail serves mostly to convey and resolve issues of weight (gravity), material, assembly and connection - to express tectonic clarity. This notion of the detail is a self-referential one. Ford refers to this type of detail as the "articulated detail – the visible manifestation of a solution to a technical problem."[7] A series of details, however, must share a common language. How a floor translates into a wall and how an aperture penetrates it should not only express itself as an articulated detail, but it should also reveals the nature of that wall itself. The role of these details in concert is to divulge the wall's characteristics: construing (appropriating Frascari) a larger order: a bringing forth of a revelation.

The discourse of prefabricated buildings has been centered on the cost-saving and timesaving benefits that these burden technologies have to offer. Architecture is not mass-produced. It is a one-off artifact made up of mass produced pieces. This Holy Grail, if you will, has become a red herring. The discussion obfuscates the potential that these new technologies have to offer in their ability to be not only self-referential but also to become conveyers. Too much credence has been placed on the economical benefits of this technology.

Employing the analogy of the automotive industry, the architecture community should not look to companies like Toyota who produces millions of identical vehicles each year; it should look to Bentley Motors Limited. As much as the architectural community would like to think of their profession as one that "mass produces" it actually is a practice of limited run productions.

Bentley employs a combination of old world craftsmanship with cutting edge technology to create one of the world's finest cars – the Bentley Mulsanne. To fabricate the rich interiors of each Bentley, 200+ hours of exacting labor goes into the leatherwork alone. Bentley employs a series of steps that intertwine and operate seamlessly between digital processes and handcrafted manual techniques. For example, the Coach-worthy leather is first selected and carefully assessed by an inspector who marks any blemishes. The inspector peruses the hide to ensure that only the best samples are used. Next, these hides are stretched across a digital scanning bed that registers these marks. The computer then tabulates how to best cut out all the patterns insuring that the blemishes do not mar the final product, which are lastly sewn by an individual; using a combination of an industrial sewing machine and hand stitching. A similar series of processes (and time) are allotted to create the equally luxurious wood components of the Bentley interior.

Advancements in technology have always promised better means to a better end. A more critical issue is at stake, however, regarding the implementation and introduction of new means in the design process. Architects should not be willing to indiscriminately sacrifice tools for machines. If new technological advancements only offer efficiency in terms of time and precision (performance) without the ability to convey (construe) than the new means do not justify their implementation. This loss will, as demonstrated by the artisans at Bentley Motor Corporation and the 14th century Benediction Monks, will come at a cost. Lewis Mumford in his book *The Myth of the Machine* describes this failure. "[T]he monastery, through its very other-worldliness, had a special incentive to develop mechanization. The monks sought, as Bertrand Gille has pointed out, to avoid unnecessary labor in order to have more time and energy available for meditation and prayer; and possibly their willing immersion in ritual predisposed them to mechanical (repetitive and standardized) solutions. Though they themselves were disciplined to regular work, and readily turned over to machinery those operations that could be performed without benefit of mind. Rewarding work they kept for themselves: manuscript copying, illuminating, carving. Unrewarding work they turned over to the machine: grinding, pounding, sawing. In that original discrimination they showed their intellectual superiority to many of our own contemporaries, who seek to transfer both forms of work to the machine, even if the resultant life prove to be mindless and meaningless."[8]

Man has always attempted to reach beyond his physical limitations. As Le Corbusier proclaimed in *Vers une architecture*, "there is no such thing as 'primitive man' only primitive means." Technology is in and of itself not the culprit. It is merely an extension of our bodies: telescopes are the extension of our sight, wheels are the extension of our feet and the bow and arrow are the extension of our fist. It is when machines transplant tools,[9] such as in the case of the Luddites, that moral and ethical dilemmas arise. New technologies should be employed in conjunction with traditional means. The addition of these innovations should not only reduce redundancies and inefficiencies, they should more importantly reveal themselves in the artifacts they make.

**ENDNOTES**

1 "In 1675 the weavers of Spitalfields rioted for three days against machines that could, allegedly, do the work of twenty men. Over a century later the engine-weavers were believed to be the cause of great distress to the narrow-weavers because they could do six times the normal amount of work, and in January 1768 attacks were made by the single-hand weavers against opponents' looms. Another classical case of an anti-machinery attack in London was the assault on a mechanical sawmill by 500 sawyers in 1768." Malcolm I. Thomis, *The Luddites Machine-Breaking in Regency England* (Hamden, CT Archon Books, 1970), p15.

2 Lewis Mumford, *The Myth of the Machine* (New York, Harcourt, Brace @ World Inc., 1962), p268.

3 Christian Becksvoort, *The Shaker Legacy* (Newtown CT, The Taunton Press, 2000), p11.

4 Marco Frascari, *The Tell-the-tale Detail Via7 The building of Architecture*, Ed. Paula Behrens, Anthony Fisher, Graduate School of Fine Arts, University of Pennsylvania and MIT Press, 1984 p24.

5 Edward Ford, *Five Houses, Ten Details*, (New York, Princeton Architectural Press, 2009), p7.

6 Heidegger, Martin. *The Question Concerning Technology and Other Essays*. William Lovitt (trans) New York: Harper Colophon Books, 1977, p12.

7 Edward Ford, *Five Houses, Ten Details*, p7.

8 Lewis Mumford, The Myth of the Machine, p269.

9 Machines and tools differ from one another in regards to how the user engages with them. As Lewis Mumford illustrates, "[t]he essential distinction between a machine and a tool lies in the degree of independence in the operation from the skill and motive power of the operator; the tool lends itself to manipulation, the machine to automatic action." That is to say, a machine will reproduce an action automatically with little input from the operator. While a tool, on the other hand, requires careful skill and minute adjustment by the user to perform consistent repetitive actions. This distinction is best illustrated in any discussion of *craft* where we associate the use of Mumford's definition of tools opposed to a highly mechanized process devoid of techniques and traditional craftsmanship. Lewis Mumford, *Technics and Civilization*, (New York, Harcourt, Brace and Company, Inc., 1934), p10.