

Subtle Technology: The Design Innovation of Indian Artisanry

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Craft culture is human culture. The impulse to shape by hand objects of everyday needs and rituals, or those things whose role it is simply to delight us, is an innately human quality, and one that may be traced to human prehistory. If we accept that crafting objects by hand is one of the defining traits of being human, then our present state of culture—in which craft has disappeared in the “overdeveloped” world and is rapidly disappearing in the developing world—should cause us to pause and think about what it is that has been lost or is about to disappear. Craft in the industrialized nations is defined by preciousness, and an extraordinary value is attributed to the handmade as an exotic species. In the developing world, it is either considered to be lowly hand-work, or a resurrected practice for the poor to gain access to valuable foreign exchange. Caught between a rock and a hard place, we in the West fetishize the object, while in the developing world we romanticize the humble craftsman and his poor condition. But neither of these approaches really looks past the artifact (as either fetish or commodity) to the role of craft as a catalyst for spurring thought and innovation in society. We may lament the loss of the beautiful objects we now view in museums, but what if the ultimate value of craft lies not in the artifact but rather in the process by which it comes to be?

Looking closely at craft-driven cultures still alive in the world can provide remarkable insights into contemporary problem-solving. For models of sustainability and economy, nothing could improve on the working methods of the craftsman, sourcing his materials locally, wasting nothing, delivering custom goods made to order—again, locally. Innovation and adaptability are the two skills most required of a craftsman to sustain his livelihood, and so we see simple and useful innovations introduced to age-old functions as society’s needs and its materials change. Tools are simple and multi-functional. Knowledge transfer is direct, from generation to generation. But most importantly, the process of shaping materials into objects, of meeting functional needs, and of fulfilling simultaneous longings for beauty and creativity involves an expression of fundamental human agency that is manifested not only as an artifact or a commercial object but equally as stimulus to innovation. This paper pursues the idea of craft as stimulus. It does this through an exploration of the element of design thinking in everyday craft practice in India.

Intimacy

The intense energy of Indian streets is the result of remarkable human activity, evident not just in the milling crowds but also in the visual exuberance of colors, patterns, signs, and symbols that are mostly fashioned by hand. This juxtaposition gives rise to a peculiar (and delightful) contradiction: on the one hand, the impersonal anonymity habitually associated with large crowds; on the other, the intimacy of an environment that has largely been brought to life by human touch. Intimacy in this scheme of things is not some throwback to an archaic world, and to affirm the intimacy of craftsmanship is not to sentimentalize the practice. Rather, intimacy needs to be seen as a quality that has both creative and practical dimensions in contemporary design practice and is the fertile ground from which innovative practice springs.

Drawing upon a popular axiom from contemporary design circles—"making is thinking"—we take the position that experiential knowledge is the most direct stimulus to innovation. Inherent in any craft practice are the multiple and repeated stages of simple hands-on contact between the craftsperson and her materials—a process that uniquely equips the craftsperson to deal with unexpected and unforeseen problems. The intimate, experiential knowledge of the craftsperson is irreducible to abstract principles. To draw on the ideas of the economist, Friedrich Hayek, such knowledge is impossible to translate into statistics, which are generated "precisely by abstracting from minor differences between the things, by lumping together, as resources of one kind, items which differ as regards location, quality, and other particulars...."¹ The process of generating statistics would thus seem to call for an elimination of the very basis of innovation that lies in the knowledge of detail—knowledge that only the "man on the spot" (as against a central authority) might possess. The craftsperson is in possession of this on the spot knowledge and we call the mode of design thinking born from such an experience "subtle technology." We further propose that the Indian craftsperson, faced with the demands of a population that is continually testing the limits of its resources, may be seen as a model for sustainable and innovative strategies that are applicable to contemporary design practice.

Anthropomorphism

Human desire for intimacy is often manifested in our natural tendency to anthropomorphize everyday objects. A vivid example of this tendency may be found in Indian "truck art." Driving through the scrubby desert landscape along the road from Ajmer to Udaipur in western India, for instance, it is not unusual to find wooden stalls selling brightly colored ribbons, hair extensions, and plastic flowers, all manner of strings and sequins, images of gods and goddesses, signage, and more. The chief clients for these objects are truck drivers who buy them not, as one might think, for their wives, left behind at

1 Friedrich Hayek, "The Use of Knowledge in Society," *American Economic Review* 35 (1945): 519–30.



Figure 1 (above left)
Truck with eye.



Figure 2 (above right)
"I am the holy basil plant of your courtyard."

home when the men embark on their long and frequent road trips, but rather, for that other beloved in the driver's life—his truck.

Purchasable accessories are only a small part of "truck art," which has a special place in Indian street design. The trucks are also lovingly painted in lavish colors and motifs, including birds, flowers, animals, young maidens, and also often body parts, such as eyes and lips. Painted eyes are meant to counteract the "evil eye" of ill-intentioned people or strangers in the vehicle behind the truck (Figure 1), but when painted strategically on or near the windscreen, they serve to endow the truck with a face of its own!

Figures are often also accompanied by textual references that cast the truck in the role of a female lover. The Hindi text on the back of the truck in Figure 2, "*Main Tulsi Tere Angan Ki*" ("I am the holy basil plant of your courtyard"), for instance, is a reference to the title of a 1978 box office hit Bollywood film. In the film, Tulsi, the hero's mistress, with whom he is deeply in love, dies after giving birth to their son, who is then lovingly raised by the hero's lawful wife. The phrase, which appears with remarkable frequency on the back of trucks in northern India more than three decades after the film first hit the screens, not only feminizes the truck but also at once recognizes its rivaling claim to the man's affections; meanwhile, it finds the rhetorical means to accommodate that claim within a familial framework, through a reference to popular melodrama. However, the meaning of Tulsi is not exhausted by the film reference. Tulsi stems are carved into beads, the beads shaped into necklaces, and the necklaces worn by "wives for the good of husbands;" thus, the reference also invokes the idea of the truck as a loyal, faithful wife whose Tulsi decoration will protect the driver/husband.

If Tulsi is richly symbolic of a romantic relationship between the truck and its driver, other text opts for a more direct line of address, albeit along the same vein. A truck encountered along the same road from Ajmer to Udaipur had a message painted on the fuel tank that cast the vehicle as an extravagant beloved (a "Queen"), and pleaded with her to check her excessive consumption of the precious "water from Iraq:" *Iraq ka paani/ Thora kum pi meri rani.*

In their work on anthropomorphism, Epley et al. argue that the need to anthropomorphize often speaks of a desire to establish social connections with other humans. Through anthropomorphism this need can be satisfied by enabling the perception of a human-like connection with non-human agents.² Truck drivers travel long distances and often spend a lot of time away from their families. It is precisely because people in India are traditionally quite connected socially that even a temporary disconnect from the social context may result in the manifestation of anthropomorphism. However, to mobilize the language of intimacy to articulate one's relationship with one's source of livelihood may have other, even more tangible consequences. To draw again upon the work of Epley et al., the universal tendency of people to attribute human-like properties, feelings, and motivations to real or imagined non-human agents and objects enables them to interact more effectively with their environment,³ enhancing their ability to make sense of a non-human agent's actions, reducing the uncertainty associated with it, and increasing confidence in predicting how it might behave in the future. Thus, anthropomorphism may be linked with a fear of uncertainty.⁴ Commercial vehicles, being a source of income for their owners and therefore playing a role in their owners' welfare, are thus far more prone to being anthropomorphized than private vehicles.⁵ Treating machines and other tools of trade as human also means that they are deemed worthy of respect and concern and not to be viewed as mere objects, which may have further implication for how well one is able to master their technical and mechanical aspects.⁶ The phenomenon of anthropomorphism described thus indexes the creative and practical uses of intimacy.

Embellishment

The pleasure signaled in the sheer excess of truck art is not fully explained by the anthropomorphism thesis. Trucks are not rigged out in flowers, sequins, and hair extensions simply to facilitate the myth of their humanity. The embellishment of trucks also fulfills a creative urge, the signs of which are distributed widely in Indian culture. This observation leads to an important corrective to the history of human cultural development offered by the ethologist Ellen Dissanayake. In her book *Art and Intimacy*, Dissanayake uses "elaboration" as another term for her earlier concept of "making special." However, as she is careful to point out, making something special is not only making it beautiful. Positioning herself against conventional histories of humanity, where the artistic impulse is considered to be a relatively late development, Dissanayake argues that, on the contrary, it was a primal impulse, originating in prehistory in the intimate reciprocity of ancestral mothers and infants. The "special" for Dissanayake arises less from a transcultural desire for beauty than from a basic human need for intimacy—both of which are fulfilled in the creative act of elaboration.⁷

2 Nicholas Epley, Adam Waytz, and John T. Cacioppo, "On Seeing Human: A Three-Factor Theory of Anthropomorphism," *Psychological Review* 114:4 (2007): 864–86.

3 Epley et al., 865.

4 Stewart Guthrie, *Faces in the Clouds: A New Theory of Religion*, (New York: Oxford University Press, 1993).

5 Epley et al., 872.

6 Epley et al., 864.

7 Ellen Dissanayake, *Art and Intimacy: How the Arts Began* (Seattle, WA: University of Washington Press, 2000).

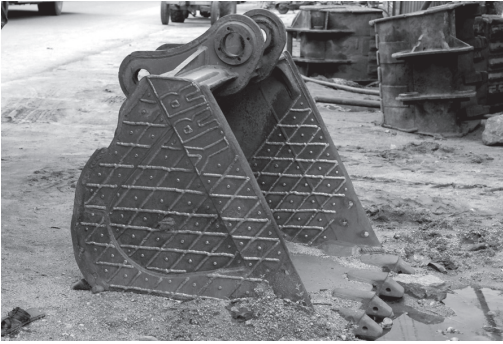


Figure 3 (above left)
A simple strengthening would not have called for the care this backhoe bucket shows in its design of welded bracing, Rajasthan.



Figure 4 (above right)
Sound as embellishment.



Figure 5 (lower right)
Decorated elephant.

Elaboration connects the maker (and user) to a unique cultural context by employing shared aesthetics in color, pattern, and material, even as it enables makers to mark the object with their individual stamp, their personality—to announce to the world their role as creator. Embellishment is a way of making something one's own, giving it an identity. In India, it is a way of expressing "I care enough to make this beautiful." Thus, the elaboration fulfills a dual purpose: to designate something as belonging to an individual and to make it special (Figure 3).

Making functional things—cups, chairs, signs, books—is creativity applied to meeting a need; meanwhile, embellishing that object requires the maker to take time, to ask more questions—questions about its function, about the person who will use that object, and about how to distinguish that object from the universe of things that surround it. Embellishing is the way we identify the object as part of a larger cultural tradition using colors, symbols, patterns, and even language. It is what takes a generic, functional thing and places it firmly in a larger cultural context. It makes the object simultaneously more particular to the maker's personality *and* brings it into the shared cultural values of beauty and function (Figures 4 and 5).



Figure 6 (above left)
Used saris are soft enough to cradle children.



Figure 7 (above right)
Old saris are used here as fencing around a newly planted vegetable garden, Rajasthan.

Adaptability

Scarcity of resources can place demands on people to become more adaptable and innovative in their daily life, and examples of contemporary Indian design thinking aimed at maximizing resources are ubiquitous. This perspective includes the kind of design thinking that is required to ensure multiple afterlives for the crafted object once its principal usefulness has been exhausted. However, while we see the craftsperson's contribution as the genius applied in forming material, we rarely give him or her credit for more abstract design thinking about the broad implications of the creation.

The unstitched garments of India, the sari and the lungi, are two of the most obvious examples of objects made for a use cycle that calls for endless adaptation of the original product. The adaptive reuse cycle is made possible, however, only by the simplicity of the original garment. The simplicity of the original shape of the garment—a rectangle with no additional stitching—lends itself to endless numbers of adaptive re-uses once the textile has become too frayed or thin to be used as clothing. Of course, the original weavers of saris were not thinking of a complex design process that would allow for such reuses; they were simply producing yardage off their looms that could be easily wrapped for clothing or other uses. The ingenuity of design adaptation in this situation came after the original sari; now, a worn garment in India is seldom considered “waste” because the fact of its “worn-ness” and age have made it perfect for re-use as a pillow, baby sling, or even a fence (Figures 6 and 7). (In contrast, today we pay minimum wage to laborers in Bangladesh to sandblast jeans for the world marketplace so that they have the right touch of softness pre-made. But this immediate, and unnaturally achieved appearance comes at considerable cost to the health of the workers and to the environment.)

In India, where petrol is precious and space on the roads at a premium, adaptive thinking leads to some innovative, and often dangerous, means for moving materials to market. The grain trucks seen across India have been transformed into balloon-like structures using soft, expandable sides, rather than rigid panels, so that they can



Figure 8 (above left)

The use of soft and expandable sides allows for these overloaded trucks to carry the absolute maximum, which also maximizes the danger of encountering one on the road.



Figure 9 (above right)

The shape of the basket places the load highest on the back and allows for more to be carried in every trip, Manali.



Figure 10 (lower right)

A beautiful cow-dung and clay floor in Ahmedabad.

carry an expanded amount of grain. These grain carriers sometimes strain credulity and safety as farmers try to include every extra grain in their load in order to make their trip more profitable (Figure 8).

In a similar fashion, women in the hill state of Himachal Pradesh, in North India, who have to carry animal bedding and fodder up steep slopes on a daily basis, have adapted a cone shaped basket so that most of the weight is forced to the top of the load, making them easier to carry, while allowing, again, for a load that exceeds the structure of the vehicle (in this case the woven basket) (Figure 9).

To practice effective, sustainable, and adaptable design is to engage in an intimate understanding of the object being made, the material of which it is made, and the complete life cycle of the material and process, beginning to end. Cow-dung, for example, has myriad uses in Indian life and is never considered mere waste product. The use of cow-dung as flooring material represents the epitome of subtle technological design thinking (Figure 10). Consider the completeness of the cycle: This floor began as soil and sunlight, then as grass to feed the cows, which then became the dung collected by women across India for fuel and fertilizer. The dung is mixed with clay and water, then applied to the floor with the hands while it is still wet, allowing it to be shaped by the hands of the maker to eventually become a firm, impermeable, cool, clean surface. In this photo of a floor in Ahmedabad, one can trace the fingertips of the



Figure 11 (above left)
Terracotta cups, or “kulhad.”



Figure 12 (above right)
A leaf bowl on a train platform in Rajasthan.

floor maker by the swirls left in the surface to dry, the ridges gently massaging the feet that walk over them. The maker of the floor must be sensitized to the degree of comfort of the ridges; too much can be uncomfortable to stand on. The beauty of the floor isn't just in the feeling in the sole of the foot as it encounters the ridges of the floor; the effect of the swirled pattern on the eyes is also appealing and soothing. Rather than a monochrome, two-dimensional, plane of a floor—a result that would be achieved by choosing a tool to smooth the surface instead of using the fingers—we see a gentle interplay of shade and shadow as light plays across the surface. This floor even has pleasing aural qualities, producing a quiet inside the home by virtue of its sound-absorbent properties.

A similarly complete cycle can be found in the terracotta tumblers (“*kulhad*”) used for serving tea on train platforms, or the leaf bowls that are filled with dal and quickly handed off to arriving or departing passengers (Figures 11 and 12). When the bowl becomes saturated (passengers must eat in a hurry, even as they must find their seat), it can be discarded on the railway platform, where it becomes fodder for the cows; the terracotta tumbler can either be reabsorbed into the soil, or is sometimes reused by the potter to make new cups.

Hand-Painted Signs

The visual landscape of an Indian street is a whirlwind of letters, symbols, words, and images, often made personal by the hand and eye of the sign painter. Indian sign painters lavish attention and flourishes on letters and symbols in the same way other craftspeople attend to the objects they make. In the streets, letterforms take on shades of anthropomorphic life—sophisticated, three-dimensional, visually complex expression, where the very surface on which the painter works often becomes part of the message itself. The sign painters have turned letters into form, with the possibility of formal expression and nuanced meaning around each linguistic corner.

Indian sign painters are in love with dimensionality and make liberal use of it in their work. Three-dimensional rendering of letterforms has become a shared aesthetic—almost an affectation of Indian sign art. However, because the work is handcrafted, the

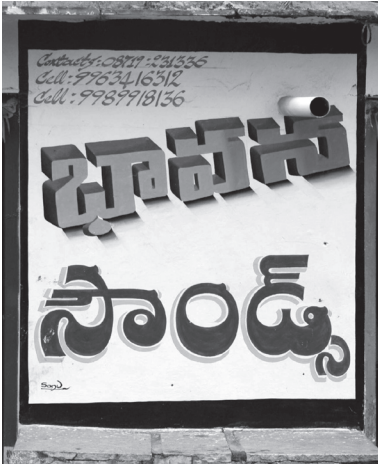


Figure 13 (above left)
Parvathagiri sign, painted with skilled three-dimensional rendering.



Figure 14 (above right)
A painted signboard in Warrangal employs a heightened three dimensional effect oriented toward the passersby on the street.

shared aesthetic gives rise to a wealth of ingenious embellishments as the shape and the form of letters prove to offer an almost limitless palette. These three-dimensional letters represent sophisticated thinking on the part of the sign makers about the rendering of three-dimensional space in two dimensions. Almost all letters get some sort of dimensional treatment, usually in the form of outlining or a drop-shadow; this sign in Telugu, from the town of Parvathagiri in Andhra Pradesh, is a brilliant example of dimensional painting (Figure 13). The blocky shape of the letters immediately implies a solidity, underscored by the shading at the top and left side of the letters. For good measure, the painter has included a black shadow at the bottom, to establish the figure-ground relationship and further enhance the sensation of dimensionality. Placing the word diagonally, and subtly shading it from dark to light, also implies depth within the frame of the sign itself. The word image emerges from dark to light, moving toward us in space. The word at the bottom with light colored outline shows a typical technique for implying dimensionality, and the letters look flat compared to the dimensional ones above, thereby enhancing the dimensionality of the words at the top. Another sign seen in Parvathagiri—a seeming hotbed of three-dimensionality in visual expression—shows a unique, single-point perspective to its composition (Figure 14).

While the Telugu sign shows a conscious, innovative use of geometrical space to convey movement and facilitate dynamic interaction with viewers, other signs show an equally impressive, or perhaps even greater, understanding of space and dimensionality. Painted signs on walls present a unique challenge. How does the painter deal with the continually changing topography and surface texture of the wall on which he paints? Sometimes this interaction results in surprising, even ingenious alterations of the message, as in this image from a wall in Ahmedabad (Figure 15). Faced with painting the same advertisement repeatedly along a foundation wall of a bridge over the Sabarmati River, the painter seizes the chance to

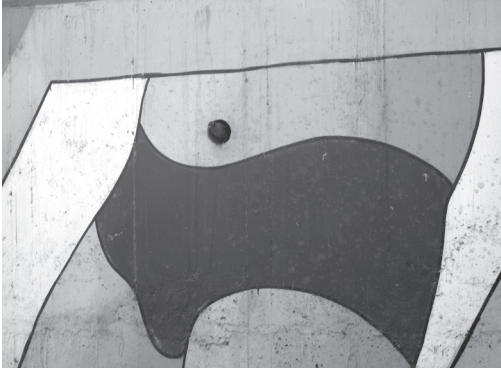


Figure 15 (above left)
Underwear sign in Ahmedabad.

Figure 16 (lower left)
The classic Indian tiffin.

Figure 17 (right)
A watertap near Kalleda, Andhra Pradesh.

add dimension, humor, and delight by incorporating a drain opening in the wall as the navel of the torso. Rather than being flummoxed by such an inconvenience, this painter exerted his agency, shifted the relationship of the torso to the holes in the wall, and created something unexpected that makes the torso come alive. And the mynah bird enjoys its home all the same.

Modularity

Modularity, as a characteristic of design thinking, has efficiency as its guiding principle. Born of the competition for space and resources, the modular impulse in design seeks simple solutions to problems, which can be seen in the graduated sizes for water pots, and in the cultural icon of India, the tiffin. Modularity not only allows for space-saving efficiencies; it also allows one unit of the module to perform dual functions: at one moment it is container, at another it is lid. In the case of the tiffin-carrier, an incredible range of efficiencies are achieved in a compact construction: It is space-saving, easily transportable, easily cleaned, and designed to retain maximum heat until the food is eaten (Figure 16).

The water-carrier is an ancient image in Indian art, and one of the arresting images still seen in many parts of the country. Women collect water from a distant source, carrying it on their heads back to their homes, just as women have done for perhaps thousands of years (Figure 17). Contemporary design of these vessels, called the “matka” in Hindi, is testimony to the power and constancy of shape as a driver of Indian design thinking. The original water vessel



Figure 18 (above left)
Kitchen interior in Warrangal.



Figure 19 (above right)
Vegetable cart in Punjab.

was most likely the calabash, a hollowed gourd with hardened shell, perfect for holding water. Because the gourds had round bottoms, a system was required to hold the one rounded surface, the calabash bottom, comfortably on another, the head. Thus was created the “eendi”—a doughnut-shaped headpiece designed to hold the pot securely while the women walked. We see this same system today especially in North India, and whether the *matka* is made of brass, terracotta, or plastic, its shape bears direct resemblance to the original—rounded bottom and all. This design seems a little counter-intuitive to westerners, who would imagine the water vessel needs a flat bottom to sit perfectly on another surface. But the *matka* and its shape persist. And it is possible to see that the design of the *matka* supports the concept of modularity in design because of how the graduated scale of water pots is designed to allow one to fit inside the other, forming a lid for the one below (Figure 18). Access to clean drinking water will, we hope, one day be a reality across India. But development of that system is woefully slow, and so women continue to bear the responsibility of supplying their families with water, at the cost of tremendous physical effort and time.

Displays of food, cloth, and tools in shops across India are powerful evidence of the importance and persistence of Gestalt grouping principles. Retail techniques, such as displaying goods in windows and interiors so that consumers can browse and window-shop, are conventionally associated with upscale department stores—a distinct development of the nineteenth century in the west, the analog of industrialization, and the catalyst for consumerism. But the marketing of ordinary goods—which often are sold on the sidewalk or from a wooden hand-cart, or even on a basket carried on the head—also often involve elaborate design, display, and sales patter that have remained unexamined. Most Indian marketplaces demonstrate the extraordinary care taken to display fruits and vegetables in appealing and imaginative ways (Figure 19).

Figure 20
Used tool display in Ahmedabad at the
Sunday Market.



To order and categorize by color, shape, and size, or to create a lively pattern with the goods being sold seems to be inherently part of the selling process. Consider the image from the Sunday Market in Ahmedabad of used tools arranged carefully by size, color, and use in a modular construction. Diverse sets of objects can then be inserted to create something resembling a typology of tool types (Figures 20). Perhaps this came about because the shop owners never had very elaborate structures to show their wares. Having only a simple cart or stall is an impetus to arrange things stylishly and in appealing ways, as if to overcome or de-emphasize the limitations of the surroundings. Whatever the reason, it is clear that even shops serving the laboring poor invest time and energy in the display of goods.

Conclusion

Since the turn of the twentieth century, design has come to be defined as a professional activity decoupled from the manufacturing process. This separation has established the design profession in hierarchical opposition to craftsmanship. Post-industrial society has even expanded the gap between the professional designer, whose practice has become increasingly strategic and information-driven, and the traditional role of the craftsman, accustomed to making decisions in response to on-the-spot conditions of materials and demand for the product. Through this series of examples of hand-crafted objects from everyday life in India, we have tried to show that the design thinking inherent to the practice of the craftsman is a reflexive and dynamic model—one that is worthy of attention for its innovative and individualized solutions. The examples used in this article have been chosen to illustrate the role of intimacy—with materials, techniques, and even clients—that shapes the work of the craftsman. Design strategies fueled by this intimacy are manifest in the modularity, adaptability, and embellishment that shape the craftsman's thinking and doing.

In addition to challenging the hierarchy in professional design and craftsmanship, this paper has also sought to challenge a parallel, and once again hierarchical, opposition between the privileging of individual identity in western cultures and the valorization of a supposedly undifferentiated communal identity in more traditional societies such as India. The examples cited show how embellishment, in the form of colors, symbols, and patterns, allows us to identify a generic, functional article as part of a cultural tradition; meanwhile, they simultaneously illustrate how embellishment makes the object reflective of the maker's distinct personality. They reveal how Indian aesthetics represent both the shared cultural values of beauty and function and the individual "signature" of the maker—the mark by which craftspeople individuate their work and make it their own.