The Way We Do Things Around Here

Specification Versus Craft Culture in the History of Building

Scott Francisco
DEGW North America, New York

Buildings have always played a role in negotiating the boundary between individual expression and social context. Through the lens of architectural history, this article explores the relationships between "community," "culture," "craft," and "specification"—concepts fundamental to the way people express themselves and develop group behaviors and collective meaning. The article focuses on the tension between "craft" as an implicit community practice based on "skill" and "knowledge", and "specification" which presumes an explicit and abstract means of communicating "information." At the center is the elusive concept of "design." But what is design? How does it affect culture at an incremental and substantial level? How do new values, both individual and collective, weigh in to the question of cultural change through design? Coming full circle, the article reflects on how the design of built space is integrated into communicative praxis itself, framing and cultivating particular forms of dialogue while displacing or resisting others.

Keywords: design; craft; culture; specification; tradition

God said to Noah, ". . . make yourself an ark of cypress wood; make rooms in it and coat it with pitch inside and out. This is how you are to build it: The ark is to be 450 feet long, 75 feet wide and 45 feet high. Make a roof for it and finish the ark to within 18 inches of the top. Put a door in the side of the ark and make lower, middle and upper decks." . . . Noah did everything just as God commanded him.

—Genesis 6:14 (NIV)

Accurately speaking, no good work whatever can be perfect, and the demand for perfection is always a sign of a misunderstanding of the ends of art.

—John Ruskin

Heaven is a place where the cooks are French, the police are British, the mechanics are German, the lovers are Italian, and it's all organized by the Swiss. . . . Hell is a place where the cooks are British, the police are German, the mechanics are French, the lovers are Swiss, and it's all organized by the Italians.

—Anonymous

1

It may not be too bold to say that the entire history of architecture is actually a struggle between *specification* and *culture*—a long, drawn out dialogue between the *implicit* and the *explicit* ways of making. Rather than producing buildings, then, architecture is concerned with giving instructions—*information* and *orders* in the context of preestablished knowledge, values, traditions, and methods. Whether this is the case or not will rely on defining several key concepts and is certainly debateable, but once the question is raised, we are immediately confronted with two extremes of how buildings come into existence. At one end of the spectrum is the complex realm of "culture" or "craft"—traditional "ways" of doing or making things, passed down from one generation to the next, that implicitly organize patterns of thought, behavior, inhabitation, and production at all levels. At the other end of the spectrum is a tendency toward uniqueness and specificity—a tendency that language (Saussure, 1959/1983)[1] and representation relentlessly promote—invention and innovation facilitated and even promoted by abstract systems of communication.

It quickly becomes apparent that the inevitable tension between these two extremes is both philosophical and pragmatic. Each extreme will have enormous consequences in every building project, as well as any cultural claim to methodology or special knowledge of building process.

Architecture, in practice and theory, is caught in the middle of these two infrastructures, as Noah must have discovered while trying to diligently follow his instructions: *Where were the "details"?* With what information or knowledge was he to fill in the gaps? The text makes no mention of whether Noah was a boat builder "by trade" or whether he had ever even felled a tree. But Noah's problem was really no different than the one we face today virtually every time we "design" something that is to be built by others: To what degree can or should design rely on the rigor of specification and "explicitness" of communication or alternatively, on interpretation and extrapolation from preexisting norms of craft culture or building trade knowledge?

Addressing this unavoidable question it seems would be a natural focus of architectural, engineering, and construction theory. Instead, it comes up vastly underrepresented in the mountains of research emerging from the field. This is particularly strange in light of the surge of interest in language, culture, knowledge management, and politics in the past two decades of poststructural architectural theory. Yet various library catalogue searches for *architectural specification*, as anything other than the most technical of manuals and handbooks, come up virtually dry.[2]

This decided (and ironic) lack of a "history and theory" of specification and craft culture is a mysterious void in the dense field of architectural discourse. Confronting this gap, this article seeks to introduce and frame the issue in a way that can create a context to be built on by more detailed research. Beginning with several texts from inside and outside architectural discourse, as well as an example of historic construction process, a network of oblique relationships between specification and craft culture will be established. The resulting provisional matrix, or "scaffolding," will hopefully be useful in building a more substantial structure of "specification

theory"—empowering builders, designers, and theorists to more effectively understand and engage the relationship between communication and making.

Why Should Architects Care?

At the center of this investigation of specification lies a question of critical importance to all architects: If they exist, where should one look for the origin, or gravitational center, of *value* and *meaning* in architecture? Although architects and theorists may agree that architecture contends with values and knowledge as a matter of course, it may not be as easy to reach a consensus on how this information is collected, created, or shared. This investigation proposes that specification empowers architects to build on and transform the traditions and particularities constituting the "value matrix" of craft and culture. But the investigation also affirms that this value matrix contains in itself layers of dense, valuable skills and information, without which building would be monological (Bakhtin, 1981)[3] and flat, if not even impossible as we know it.[4] The role of the architect, therefore, is a form of cultural leadership—finding a progressive balance between explicit and implicit making, between specification and craft and in so doing, creating shifts in culture systems that address new problems or ideas. To have a voice, architecture must challenge a value matrix, but it must do this without causing alienation between the system of communication and individuals or populations that inhabit it.

Dominant and Emergent Cultures

In his famous essay "Base and Superstructure in Marxist Cultural Theory," Raymond Williams (1973/1998) confronted the dialectic between the *implicit* and the *explicit* and examined the role of "intentionality" and "totality" in what he termed "dominant" and "emergent" cultures. According to Williams, dominant cultures are "made and remade" through education, family structures, definitions of work, and *selective traditions* "at an intellectual and theoretical level" (p. 495). Here, these practices, meanings, and values become "incorporated" and, thus, deemed "natural." They become "*the* tradition" to the exclusion of alternative pasts and practices (i.e., traditions *plural*).

In terms of craft culture, this would be analogous to a craft technique being "passed down" by a family member or local master craftsman—a regional pattern of weaving for example, or a particular style of wood joinery or brick masonry that continually "becomes" the local tradition by virtue of its exclusive use and teaching.

Williams (1973/1998) introduced "emergent cultures," by contrast, as an alternative to the dominant culture and identified them as cultures that continually create "new meanings and values, new practices, new significances and experiences" (p. 495). For Williams, emergent culture is seen as a "practice" (p. 497), a proactive way to

challenge and displace the hegemony of a dominant class or culture (which according to Marxist theory, is in need of overthrow by definition). Thus, Williams delineated a process analogous to "socially conscious" architectural design, particularly that of early modernism with its visions of social reform through material construction. But without getting mired in a discussion about the failures of either modernism or Marxism, we may conjecture through many historical examples that in any reform endeavor, the ratio between "specified" and "existing" (i.e., dominant) culture will find itself in a state of imbalance. Reform is inherently unstable, but added to this lack of balance is the confusion that results when new values are introduced—the very reason specification is needed to begin with. If new values were not being actively introduced, there would be no need for specification—relevant values would already be implicit and, therefore, have no need of further articulation. *Reform, then, is a design project, and design always a kind of reform*—despite that in contemporary usage, the word *design* is no longer associated with purpose intentionality.[5] This is particularly puzzling given that the root meaning of *design* is based almost purely on the concept of intention.

Intention

Can there be *design* without intentions? It could be argued that one cannot even be *human* without intentions; presuming "the human" has survived deconstruction[6] and the subsequent "posthumanism." If it has, the effective question remains: *What are our intentions, and how will they be communicated?* Postmodern thought seems to support a divestment of values and intention[7] from design through dispersion and relativism. But what has happened in practice is that intentions have been shifted from the realm of the ethical to the aesthetical in an attempt to escape the problem of fundamentals and hierarchy.[8] Specification theory reframes any attempt to dislocate intentionality from design (and today there are many) as something "outside" of design—as a science more akin to physics, geography, or perhaps biology. If architects, on the other hand, desire a voice that contributes to any kind of "new meaning," an understanding of specification and its theoretical context will become a primary tool for developing emergent cultures in both building process and form.

Words

Following this introductory dialectic between specification and culture, explicit and implicit making, information and knowledge—and in keeping with the goal of building a conceptual framework for theoretical expansion—a series of definitions now become essential. In fact, the claims that have been made up to this point are so

contingent and volatile that definitions may be the only way to disentangle them and proceed with any further development: What then, after all, is *culture*?

Paradoxically, this process of defining is a working example of our primary concept of "specification." But lest underlying intentions be displaced by the seductive aesthetics of *definition*, a reminder is inserted here that this article, like any "tectonic" work, seeks to understand and create relationships *between* concepts. Although definition, like specification, is as old as language itself, it is also subject to constant forces of fashion, evolution, power, and politics. To avoid entering into a linguistic dissertation, we will call on two principles that allow us to move forward in spite of any doubts: (a) Words mean *something*; and (b) These meanings are in constant flux.

In his famous book *Keywords—A Vocabulary of Culture and Society,* Williams (1976) confronted these truisms and their consequences. Inspired by the author's shock at returning from the war to find a changed vocabulary and cultural landscape, the book is an attempt to understand and record the changes that had taken place in the meanings of certain "keywords"—words that Williams believed are particularly formative in a new way of seeing the world. Williams's analysis is one of both deep structure and small successive shifts that in themselves seem almost trivial. But the global academic impact of the book strengthens and clarifies its own thesis: that whatever their multifarious origins, words are important; and they define how groups of people share ideas about who they are and how they see the world.[9] Following Williams's model (and enlisting his help on several occasions), what follows are some "keywords" to facilitate and enrich a dialogue between specification and craft culture.

Specification

Despite a scarcity of specification theory, there is no shortage of technical manuals on the subject of "construction specifications writing." A catalogue search at Massachusetts Institute of Technology's Rotch Architecture Library revealed 84 titles containing either *specification* or *specifications* and 20 with the more specific *construction specifications*. Following their namesake, these texts usually begin with a definition of their subject. Here are a few samples:

> In simplistic terms, the object of *specification* is to communicate to someone how something is to be done, so that the specifier's intentions are clearly understood without doubt or ambiguity, and there will be no confusion in the mind of the person who has to perform the specified works. (Scott, 1984, Introduction section)
>
> A definite and complete statement, as in a contract . . . the precise method of construction. (Stitt, 1999)
>
> In the field [of construction] a specification is regarded as augmenting or supplementing, with *words*, the drawings or other documents that describe a project with lines or symbols. . . . A specification is a combination of words properly describing the quality of a

product, its method of manufacture, its installation into a project, and, in some cases, a description of the final result or appearance. (Willis, 1997)

Equally self-referential and ironic are dictionary definitions of *specification*:

A detailed description of a particular thing, especially one detailed enough to provide somebody with the information needed to make that thing
1. [n] a restriction that is insisted upon as a condition for an agreement
2. [n] (patent law) a document drawn up by the applicant for a patent of invention that provides an explicit and detailed description of the nature and use of an invention
3. [n] a detailed description of design criteria for a piece of work
4. [n] naming explicitly. (*WordNet 2.1*, n.d.-b)

Specification, from its root, is specific and, thus, explicit. It is intrinsically bound up with the limits and power of language to express concepts and information clearly, or at least *clearly enough.* Specification is a transfer of information—a message that requires minimal "knowledge" but total reliance on "terms," "classifications," and "standards" (Bowker, 1999).

Detail

Following in close succession to "specification" in architectural communication is the even more commonly enlisted term *detail*. The relationship between detail and specification is critical given that they each form such close parts of the specificity and intentionality of construction documents. In modern usage, an architectural detail is generally thought of as a graphic or drawing of some kind, usually an orthographically projected cross-section, whereas a specification is most often a written (i.e., text)[10] document. Despite the important nuances these differences create (a topic for another article), we allow that their communicative purpose is highly similar: to deliver clear and explicit information about the composition of a building or component of a building. For the purposes of this article, therefore, we suspend the important distinctions that these different media afford and allow detail and specification to be thought of as two parts of specification in general, lending conceptual weight to each other and to the total concept.

Edward Ford's (1990) famous book *The Details of Modern Architecture* has become one of the most established references on the specificities of "modern" construction. Because the book deals primarily with building in the Modern architectural canon, it secures a captive audience—historians, students, and theorists who often lack firsthand knowledge of construction. The popularity of this book is, thus, paradoxical and can be seen as both a function of and contribution to the well-known detail fetish of many architects and designers. Addressing the paradox between architectural

knowledge and information, Ford anchored his book with an extraordinarily clear and powerful outline of the concept and historical significance of "detail":

> In one sense detailing was born when artisanship died. It is always surprising to see how little the drawings of Renaissance architects resemble the finished buildings, particularly in such details as column capitals. The quality of these elements is due largely to the quality of their execution, and the men who executed them had a fair degree of latitude in their adaptation of the design. (p. 7)

Given this simple and profound contextualization of the detail, it is ironic that a critical omission in Ford's presentation of the details themselves remains: a lack of original source material in the form of drawings or specifications from the architects he showcased. Instead, Ford took information from a variety of sources, often the existing buildings themselves, and redrew these "details" in his signature axonometric[11] drawing style popularized by the book. In doing this, Ford shifted the focus *away* from the vital communication process between architect and builder (which might have revealed valuable means and degrees of interpretation) back to the product *as it was built*. Each "detail" in his book, thus, must be viewed as an unknown mixture of craft and specification, *concealing* the mixture of intentions, traditions, and extrapolations that unavoidably contributed to the building as a collaboration between architect and builder.

Culture

> Happy for me, utility, economy and despatch are the ruling passions of the day, and will take preference of expense, idle elegance and show, until the minds of men become contaminated with vanity or some worse passion.
>
> *—James Finley, 19th-century bridge designer (Kranakis, 1997, p. 37)*

Kranakis's (1997) quote, by a little known engineer/entrepreneur promoting "iron-chain suspension bridges" in the early 19th century, is a beautiful illustration of how *culture,* and the values it carries, interweaves itself into the built landscape. As a designer who was basically trying to mass-market a more efficient bridge design, Finley realized quite clearly how the power of culture—"the ruling passions of the day"—would influence his endeavor.

"Culture is one of the two or three most complicated words in the English language," Williams (1976, p. 77) began in *Keywords*. The root word *cultura* "had a range of meanings: *inhabit, cultivate, protect, honor with worship*. Some of these meanings eventually separated, though still with occasional overlapping" (Williams, 1976, p. 77). As Williams pointed out,

> *Culture* in its early uses was a noun of *process*: the tending *of* something, basically crops or animals. . . . From early in the 16C, the tending of natural growth was extended

to the process of human development. . . . Culture as an independent noun, an abstract process or the product of such a process, was not common before [mid 19th century]. (p. 77)

On the opposite side of the political arena from Williams's (1973/1998) Marxist analysis comes another one, also pragmatically driven but originating from the young domain of Business History and Theory. As the competitive-edge–hungry business world has faced ever-tighter margins, they have begun to embrace studies coming from the humanities with increasing respect, hoping to find and operationalize applicable models. In his award winning *Culture and the Practice of Business History*, historian and writer Kenneth Lipartito (1995) defined culture for this audience "as a system of values, ideas, and beliefs which constitute a mental apparatus for grasping reality" (p. 2).

As an aggregate, these definitions combine to form a relatively simple idea: Culture is a constantly and actively developed framework of collective values held between individuals that allows these individuals to have understanding and communication through their everyday actions; producing inhabitable boundaries for shared identity, ethics, and aesthetics.

Craft

The word *craft* today has connotations that range from dark and ancient occult practice to the naive "creative" productions of children with dried noodles, glue, and gold paint. Maybe for this reason, *craft* is a word loosing its currency on construction sites today. It is rarely used except to evoke values and traditions that are most often absent from contemporary building practice—where systematized industrial processes and rigorous division of labor have become the norm. Yet despite its rarification, the word *craft* remains without question a powerful descriptor of values associated with historic construction culture—values that survive, although difficult to locate and practice in today's construction.

Webster's Third New International Dictionary (1969) defines *craft* in part as

The members of a particular trade or an association of these: GUILD <the ~ of the iron mongers>
Skill in deceiving for the promotion of one's own ends: CUNNING, GUILE <an enemy of great ~ and subtlety>.

And *WordNet 2.1* (n.d.-a) defines *craft* as

1. [n] the skilled practice of a practical occupation; "he learned his trade as an apprentice"
2. [n] a vehicle designed for navigation in water or air or through outer space
3. [n] shrewdness as demonstrated by being skilled in deception

4. [n] skill in an occupation or trade
5. [n] people who perform a particular <u>kind</u> of skilled work; "he represented the craft of brewers"; "as they say in the trade"
6. [v] make by hand and with much skill

Distilling these definitions leaves us with several core ideas: *skill* (usually of the hand), a *community of practitioners defined by membership*; and *secret or protected "knowledge."*

In *Crafting the Public Realm*, Indian architect and theorist Prem Chandavarkar (2002) opened the discussion of craft from a different angle, bringing its principles into the center of contemporary discourse by drawing a relationship between craft culture and the new "open source" design movement—a movement that is gaining recognition as an alternative to conventional "proprietary" (i.e., *specified*) design. Chandavarkar's article, it is worth noting, was written in Bangalore, a city on the cutting edge of global software development and design, whereas at the same time situated in a landscape where traditional craft cultures still survive to produce much of the goods, products, and buildings for the surrounding population. Chandavarkar outlined the important characteristics of craft culture from his perspective:

1. Craft is practiced by a community.
2. All ideas belong to the entire community; if any single craftsperson comes up with a new idea then that innovation serves to extend the visual language of the entire community.
3. The craftsperson does not seek to be compensated for the value of his/her ideas, and only claims compensation for the cost of time and materials.
   The business model is not linked to any claim to compensation derived from intellectual property rights. It is based on the cost of a service provided, where the commercial valuation of the service is not linked to the idea on which it is based. This is similar to the "publish the recipe and open a restaurant" argument that is often stated in the open source world.
4. Each innovation does not seek to start from scratch. Innovation is based on building upon what the community has already produced. The craft develops in a gradual, incremental "bazaar" mode rather than an integrated, grand-design "cathedral" mode.
5. Judgement regarding quality is based on peer review.
6. Community development is valued above personal glorification.
7. Every contribution to a craft is judged on two counts—the utility it contributes to the immediate task at hand and the extent to which it contributes to the development of a symbolic language that is useful to the community at large.

In Chandavarkar's sense, craft becomes a model for an open design movement where personal ownership of "ideas" is undesirable. New ideas are developed in the context of a community and, thus, "owned" by the community as a whole. In this sense,

clear, explicit specification would be of little use, presuming that the community would learn and appropriate these ideas and resultant knowledge directly from within. One could even infer that a lack of reproducible specification would be an asset, protecting the community from the theft of knowledge and practices by those outside, thus, inverting the notion of "open" and "closed."

This contradiction between the open and closed sense of craft culture is seen even more clearly in histories of craft that are guarded and ominous and linked to the secret ritual practice of groups such as Wicca (Witchcraft) and the Freemasons. A preliminary examination and distillation of these complex groups leaves at least several relevant fragments: Both examples are based on collective practices, ways, or rites. Unlike many other religions, the secrecy, precision, and materiality of these ritual practices are key to their identity and efficacy. The practices are guarded and taught to prospective initiate members with deference to their power, be it magical, medicinal, or even political.

This closed, secretive sense of craft emerges from a history of craft and guild quite opposite to Chandavarkar's (2002) "open community" and practice. Exploring this aspect of craft in European history, author Gilles C. H. Nullens (2003) described its exclusionary and protective origins:

> In France, the Craft guilds imposed long periods of apprenticeship from its members, requiring candidates to prove their skill by providing a Masterpiece, [while also] appointing controllers to fix the working rules and ensure that work was well done. . . . People who could not afford the cost of doing this training and the Masterpiece could follow a different and less expensive procedure and receive the title of "perpetual companion"; but they could not open their own shop or employ other workers.

Following these examples, craft has a sense of both *shared* and *guarded* practice and knowledge. It refers to a level of skilled (i.e., learned and taught) precision work with "material" that is *implicitly specified* by traditions, held collectively by a community of craftspeople—to some degree *excluding* those outside this community.

Tradition

The concept of tradition cannot be overlooked in this investigation, referring as it does to particular "practices" or "ways" that are passed intact *from the past into the present*. Tradition seems to stand in direct contrast to "innovation" or "novelty"— instead lending a sense of stability, constancy, and inertia to ideas as they move through time and context.

Chosen by Williams (1976) as one of his influential "keywords," *tradition* "came into English [in the early 14th century] from tradicion, oF, tradere L-, to hand over

or deliver," (as in *trade*); "the Latin noun had the sense of handing down *knowledge*, passing on a *doctrine*" (p. 269). Williams made it clear that there is an importance in the word's active and passive sense—"an active, and oral handing down"; "old songs delivered to them by tradition from their fathers (1591)"; as well as a weighty and truth-bearing entity: "Will you mocke at an ancient tradition began upon an honourable respect (Henry V)" (p. 269). Williams noted that it is this "range" that is important, joining the sense of "handing down" with that of "respect" and "duty." Williams went on to highlight the fact that

> there are traditions present in *values* and *standards*, [but when we recognize] that only *some* of these have been selected for our respect and duty, we see how difficult tradition is. . . . It is sometimes observed that it only takes two generations to make anything traditional: naturally enough, since that is the sense of tradition as an active process. (p. 269)

Tradition is, thus, a fundamental component of craft, describing the process of "handing down" knowledge but also of selectively valuing the information that is passed down. For this reason it is easy to see why tradition has been adopted as a generally positive notion, while at the same time standing as both a symbolic and practical bulwark against the modern programs of change and progress.

Design

Design as a concept is so intertwined with architecture that its definition automatically plays an enormous role in architecture's identity. Writer, theorist, and structural engineer William Addis (1990) addressed the complexity of the term *design* in his book *Structural Engineering, the Nature of Theory and Design*. He began with a definition of *design*, and like Williams (1976), Addis unfolded a chronology of the word's usage during the past 500 years:

1548 to plan out
1579 to trace the outline of, delineate
1588 purpose aim direction
1593 a plan or scheme . . .
1638 a preliminary sketch for a work of art
1662 to draw, sketch, etc.
> . . . but design as a verb now relates to almost any part of the act of creation of almost any product . . . and as a noun to an abstract quality of an artefact. . . . Curiously, none of these meanings includes what engineering designers would say is its principle meaning—to describe what they are doing when they design a bridge or building or boat or car. (p. 1)

What is it that designers *are* doing when they design? At its most basic level, design seems to describe a process of planning, representing, and testing *through*

representation that is removed from the constructional action itself. In this distance between plan and action is located *intentionality*: the mind at work on a particular problem that weighs and values possible outcomes of an action. It is this intentionality of design that makes for a useful comparison and contrast with *tradition*. As Williams (1973/1998) has noted, intentionality may also be present in tradition, but in tradition, unlike in design, intentionality is located in the source or origin of an activity.[12] Despite this fact that "creating a tradition"[13] may be conscious and projective, any intentionality is automatically concealed by an appeal to "how something *was*, and therefore *is,* and *should be* done"—in short, the appeal to *tradition*. Design, unlike tradition and craft, makes an *explicit* concept of intentionality and value, empowering an individual or group to enter into a process of open dialogue on what is valued and the future and possibilities of achieving these things through specified action. In this sense, Design is a fundamentally modern concept effectively relying on specification for realization.

Tectonic

Tectonics as a concept brings us into direct confrontation with the *process and aesthetics* of thoughtful construction and, thus, can be very useful in clarifying architecture's relationship to both specification and craft culture. As a field of study, Tectonics deals directly with the concepts of *whole* and *part* but more important, with the specificity of their *relationship* (i.e., *how things are put together to make more complex things*). We can assume, therefore, that tectonics in some form will be crucial in both "craft" construction and "specified" construction, although the specific expression and communication may be quite different in either case.

Architect, critic, and theorist Kenneth Frampton's (1995) *Studies in Tectonic Culture* is widely considered the "tectonics bible"—one of the most exhaustive writings on tectonics from a theoretical architectural perspective. In the first chapter, "Reflections on the Scope of the Tectonic," Frampton outlined the basic tenets of a tectonic understanding—one that is both rooted in history and projective for contemporary practice.

Frampton (1995) described the history of the term *tectonic* as "having its origin in both Greek and Sanskrit, referring to the craft of carpentry and the use of the axe" (p. 3). After successive evolutions, the term shifts to "the art of joining . . . the assemblage not only of building parts but also of objects" (p. 3). Frampton then made clear his personal bias, underscoring the special value he placed on tectonic expression and its unique role in architecture:

> Without wishing to deny the volumetric [spatial] character of architectural form, this study seeks to enrich the priority given to space by a reconsideration of the constructional and structural modes by which, of necessity, it has to be achieved. (p. 3)

Tectonics as a field of architectural discourse has become a kind of apologetics for materiality, exalting the building process as a poetic pursuit—an arts and crafts opposition party to the informationaly mediated, deconstructed, and aestheticized world of postmodernism. Frampton's (1995) basic argument is that in the special relationships *between* "parts" that make up a building, there exists a realm of expressive potential that is unique to architecture. These parts exist at many levels: not only "constructional" in a conventional sense, such as beams, rafters, notches, splices, nuts, and bolts but also in the realm of larger conceptual building elements such as the earthwork, hearth, framework, roof, and enclosing fabric (Semper, 1989).

A Composite Map of Architecture

Each of these discrete but interrelated concepts, in their mutable yet foundational essence, begin to delineate a map of architecture's relationship to both specified (informational) and crafted (cultural) ways of building. Through them we understand that architecture must be specified—made explicit—to have its necessary intentionality. Yet craft and culture form an essential background—a value matrix or "dominant culture" of implicit knowledge against which explicit instructions, information, and innovations function, continuing to inform and reform craft knowledge.

The Case of Brunelleschi's Dome

A radical example of the split between specification and craft is found in a touchstone of Western architectural practice: Filippo Brunelleschi's role in the construction of the cupola dome over the Santa Maria del Fiore Cathedral of Florence is possibly the best-known and most compelling historic example of the productive tension between craft culture and specification ever cited. In fact, Brunelleschi's involvement with the dome is so thoroughly embedded with the concept of specification in relation to the existing craft cultures of the time that it becomes hard to know which parts of the history to begin with. The cathedral dome in Florence, built in the first half of the 15th century, arguably remains to this day the largest masonry dome ever constructed. The dome was built without any "centering" support structure, which in combination with its octagonal geometry, makes it a complex problem of structural engineering and construction process. Although the base of the cathedral, begun a century earlier, was built in anticipation of a solution, this was a matter of faith, given that no existing dome could be used as a precedent at the time (King, 2000, p. 3). The construction of the dome would have to rely squarely on the future creativity and inventiveness of humankind, working both with and against the existing patterns of traditional building.

Ross King's (2000) rigorously researched historical novel *Brunelleschi's Dome* provides a provocative narrative account of the dome's construction. King began by

stating that in 1418, after more than 100 years of construction on the cathedral of Santa Maria del Fiore, a competition was announced in Florence that read

> Whoever desires to make any model or design for the vaulting of the main dome of the cathedral under construction—for armature, scaffolding or other thing, or any lifting device pertaining to the construction and perfection of said cupola or vault—shall do so before the end of the month of September. If the model be used he shall be entitled to a payment of 200 gold Florins. (p. 1)

King continued,

> After the many plans submitted by craftsmen from far and wide, only one seemed to show much promise. This model made of brick was built not by a carpenter or mason, but by . . . a goldsmith and a clockmaker named Filippo Brunelleschi. (p. 11)

In the 28 following years, Brunelleschi dedicated himself to inventing solutions to all types of construction problems and processes: masonry patterns, structural ironwork, measuring tools, cranes, hoists, boats, and so forth. One might go so far as to say he was a Renaissance Man. But whatever the complex reality lost to history, Brunelleschi has come to represent the architect as an individual genius—an inventor, solving new problems in creative ways, and surmounting the obstacles of ignorance and technical limitations that surround the individual in society. Here are a few key concepts that historically define Brunelleschi's work and its significance:

- The dome project began as a public appeal to solving a longstanding construction problem to which *no known solution existed at the time*.[14]
- Brunelleschi's responses provided *completely novel solutions*, as well as innovative reconfigurations of existing and even ancient technologies. These responses were integrated, involving all aspects of the construction process.
- Brunelleschi was obsessed with *protecting the ownership* of his ideas on which his livelihood depended, often committing them to memory or using a cipher to prevent others from appropriating them.[15]
- Brunelleschi did not act as a craftsman or builder. He was elected as the director, conductor or "capomaestro." Although this role proved precarious at several points in the process and was not clearly defined, he was recognized as the man with "ideas" and inventions for how to get things done. *He was paid for these ideas, not for manual or even managerial skill*.[16]
- Brunelleschi filed for the first ever patent (King, 2000, p. 112) for a boat designed to transport marble. This patent helped solidify the position that *ideas have currency* and, thus, need an abstract form/system of communication (specification, drawing, or writing) to codify and, thus, *exchange* them.
- Brunelleschi worked in opposition to craft culture, as well as in synergy with it. His work necessarily and continually distinguished itself from the existing craft knowledge of the time, but at the same time worked very closely with these skills and workers to achieve built results. Brunelleschi himself was close to the craftsmen, in many cases giving his specified instruction to them directly (King, 2000, pp. 78-79, 92).

Each of these *ways of working* indicates a departure from a traditional craft-based formula for problem solving, which by its nature would have had a difficult time rising to unforeseen problems or hitherto unknown requirements. Where tradition has its roots in precise repetition of *form* in response to known conditions, specification is based on a precise translation between *abstraction* and *execution*, allowing new ideas to emerge unencumbered by traditional ways or forms.

Throughout the dome's nearly 30-year construction process, Brunelleschi repeatedly invented unique solutions to problems that by definition, required explicit communication to be realized. Often this was done through face-to-face transaction by the "capomaestro" himself, given his fear of committing his ideas to paper lest they be stolen by one of his rivals. Although this type of face-to-face transaction does not lend support to the idea of a *written specification*, it does make a critical turn toward the *value of ideas*: If ideas themselves have currency and exchange value, then their explicit transmission becomes the key to their "exchangeability." Unlike a craft, which is based on specific "skills" residing in the individual craftsperson (and, thus, not transmittable other than through making or direct teaching), an inventor/specifier must be able to explicitly transmit an idea to others across diverse contexts for the idea to have value. Depending on their novelty, utility, and specificity, these ideas are accepted as having exchange value, in which case ownership is claimed and protected. The emergence of the patent system is just one consequence of this development. In Brunelleschi's case, such proprietary claims, which had no real precedent at that time, created many complex and ambiguous relationships between specification and the craft culture in which he was working.[17] An example of this is the incident of the "timber chain," a thrust-resisting ring of wood embedded in the dome. Brunelleschi's unique design of this structural element would later be used to reestablish his intellectual and problem-solving mastery over a rival who threatened to unseat him as "master of the dome construction" (King, 2000, p. 78). In King's (2000) account, Brunelleschi feigns sick, allowing his rival to design and begin construction of this critical structural element. After sufficient time had elapsed to set the hook, Brunelleschi rises from his "deathbed," ascends into the dome, and demonstrates the ineffectiveness of his rival's timber-chain design, thus, resecuring his position as master designer. His message was clear: Without Brunelleschi the man, and the explicit information he was providing, the dome would fail to stand.

This is just one example demonstrating how Brunelleschi believed that for his ideas to have value in and of themselves, they must be "specific" and, therefore, not part of any existing base or system of knowledge. Once again, Brunelleschi was not being paid as a skilled craftsman[18] but rather, as someone who could *innovate*: solving problems that had remained unsolved for more than a century. Thus, the value of Brunelleschi's ideas were weighed according to their *uniqueness*, even in the face of an advanced construction culture and an industry that was controlled by highly political guilds and crafts, each with some amount of power at a social, political, and technical level.[19]

Brunelleschi's work is an example of architecture becoming itself through a dialogue between tradition and innovation. Through the use of explicit specifications, intentionality and imagination were able to transcend a dissatisfaction with the seen and known. In the space opened up by this restlessness lies the propelling belief in unique human genius and the power and meaning of design.

Conclusion

Brunelleschi's Dome reveals a productive interdependency between two systems of knowledge and information sharing: craft and specification. It is certain that the Dome could not have been built without a litany of crafts and trades that each played crucial roles in the immense project. But these trades were not enough to solve the problem of the Dome's construction. Into the existing "bazaar"[20] of craft culture was inserted the "cathedral" of design, relying squarely on the explicit nature of specification. What transpires after the completion of this project is the next question: Do the crafts and trades now carry forth as *knowledge* the new information which has been inserted into their culture through specification? An obvious response might be the dome over St. Peter's in Rome, but this is another story. . . .

The dialogue between explicit and implicit—*specified* information and *cultured* knowledge—is critical to any practice or theory of architecture. Every architect must choose how preexisting cultures and crafts, along with the values they embody, will be engaged or challenged. In this space of intentionality is the call to be human: A belief in ideals that reach far beyond a closed cosmos of natural cause and effect. And even more human than this belief is the desire to *build* these ideals—bringing them out from the realm of mysterious spirit and truth and into communion with the body's material world.

Notes

1. The father of structural linguistics, Ferdinand de Saussure (1959/1983) was to propose "language as a structure"—a system of (specified) relations between "signifier and signified." "The arbitrary nature of the sign" was also a critical part of his linguistic theory.

2. This search process in architectural and engineering libraries (including periodicals) turned up an inexhaustible supply of "how-to manuals" and "guides" for specification writers, architects, and engineers, most of which had rarely, if ever, been borrowed from the library. Only two of these books contain a paragraph of "history," which turned out to be simplistic and trivial. It is interesting that several books, in particular Harold Rosen's (1999) *Construction Specifications Writing*, contain detailed commentary on the future of specification. (This was not, on the other hand, the case in the field of business, organizational, and leadership writing, where there seems to be a high degree of interest in the relationship between cultural difference and language specificity.)

3. Mikhail Bakhtin (1981) developed a theory of "dialogism," which also introduced the antithetical concept of the "monological" as a description of hegemonic and sterile language.

4. The *as we know it* here is the key to understanding this statement. Does building require the as we know it to be perpetually present? Certainly culture and craft do. Craft and culture are direct manifestations of the as we know it mantra.

5. The current trend toward parametric and biomorphic design reveals a distancing from direct (subjective) involvement in design decision making and the intentionality this requires. Many design researchers are looking to the digital realm to help them engage "evolutionary precedents" on which to base new parametric design models and tools that can operate without the interference of intentions.

6. Foucault's (1994) argument is that the Human Being is a social construct that is hegemonic and suspect. In *The Order of Things*, Foucault concluded that "one can certainly wager that man would be erased, like a face drawn in the sand at the edge of the sea" (p. 387). This wager was one of the key sparks for the movement of "posthumanism," a movement embraced by many of the poststructural theorists either by default or even active support.

7. In the sense used here, "intention" has an aspect of being somehow "grounded," an arguably modern and premodern concept that has been well deconstructed by postmodern theory. On the other hand, intentionality as merely a subjective tendency is very much in keeping with postmodern relativism. This conflict between intention attached to universal(izing) referents, versus intention with only localized or "provisional" goals, is at the heart of a great philosophical divide.

8. We have no squeamishness in the Institute about agreeing on the "seductiveness" or "distastefulness" of a design project based on aesthetics or even "process"; but calling to task a project on the basis of "ethics" must always be "unsupportable" if not institutionally taboo.

9. According to O'Connor (1989),

Williams's [argued that] Marxism tended to make cultural history secondary (to economic or political processes) when what is needed is to make cultural history material. The crucial place to start is with language, which is not in any way secondary, but is itself material. For Williams the materiality of language implies two principles: first, that language is historical; and second, that language is practical constitutive activity, or practical consciousness. The argument is made in his own terms, but also in a dialogue, mainly with Volosinov's *Marxism and the Philosophy of Language* [1973]. (p. 110)

10. This opens another line of enquiry into the parallel between text and context, specification and culture, and the explicit and implicit.

11. Axonometric projection drawing (3D) is rarely used by architects or engineers for drawing details and, thus, Ford's (1990) drawings are readily distinguished from original source drawings.

12. For example, "This is a good way to make a house, (because) my Grandfather did it this way."

13. Williams (1976) referred to traditions as "constructs," as previously referenced in *Keywords*.

14. The original "design" of the dome, the biggest in the world, had been conceived without the technical knowledge of how to construct it, yet this "design" was "voted in" and even expanded from its original diameter, despite this fact:

Even the original planners of the dome had been unable to advise how their project was to be completed: they merely expressed a touching faith that at some point in the future God might provide a solution, and architects with a more advanced knowledge might be found. (King, 2000, p. 5)

15. Brunelleschi worked in isolation:

Secrecy and individual effort were to be the hallmarks of his working habits . . . whether making architectural models or specialized inventions such as hoists and boats, he insisted on his own solitary authorship, never committing his ideas to paper, or if he did only in cipher (code) . . . always fearful that some unworthy soul would bungle his plans or attempt to steal credit for them. (King, 2000, p. 19)

It is ironic that because of these tenuous claims to ownership (which had to do with the lack of legal and "forensic" sophistication needed for copyright protection), he chose not to specify his inventions in ways (words or drawings) that would be legible and transparent to others. To maintain his

ownership and mastery, therefore, communication was intentionally "personal," allowing him to retain control through the structure of the process: Brunelleschi as the personal bearer of genius.

16. Brunelleschi came from "outside" the craft traditions that were responsible for actual construction. He was a jeweler and clock maker not a mason by trade.

17. It is worth noting that Florence was a place full of artists, whose "personal genius" was constantly in the forefront of the public consciousness. For this reason, the idea of individual claims to ownership of ideas was not a new concept, even if it had not yet been applied to such "mechanical arts" as hoists for lifting sandstone blocks or new bond patterns for brickwork. It is in this junction that the question of architecture's place in the arts comes home. Even after all that he accomplished, Brunelleschi received a relatively modest but unique epitaph on his unadorned grave: "Here Lies the Body of the Great Ingenious Man Filippo Brunelleschi of Florence" (King, 2000, p. 156).

18. According to King (2000), the 200 florins offered as the competition prize was "more than a skilled craftsman could earn in two years of work" (p. 1).

19. This power was not necessarily commensurate with a particular guild's technical importance to the cathedral project. The Wool Merchant's Guild, for example, was responsible for the funding and oversight of the entire cathedral project, a task that was primarily out of their field of knowledge. The relation between craft, community, guild, and social power is an interesting question and would make for a particularly relevant study today in light of the new power relations emerging from the communications technology field (Saalman, 1980, p. 6).

20. Raymond's (2001) *The Cathedral and the Bazaar*, a seminal publication for the open source design movement, advocates the subversive, accommodating, adaptable, redundant, and nonspecific network of the bazaar as a system, model, or pattern for design. This is offered as a superior model to the more specialized, explicit, specific, linear, unadaptable and, thus, arguably hegemonic system of the cathedral. Although I feel Raymond's argument offers a powerful metaphor, it is also highly simplistic in its understanding of gothic construction and the overarching idea of the cathedral as a community symbol and space. It overlooks the critical function of monumentality in the construction of communal identity on which the bazaar arguably depends, in other words, *no cathedral (or mosque)—no bazaar*; but this too will have to be saved for another article.

References

Addis, W. (1990). *Structural engineering: The nature of theory and design*. New York: Ellis Horwood.

Bakhtin, M. M. (1981). *The dialogic imagination*. Austin: University of Texas Press.

Bowker, G. C. (1999). *Sorting things out: Classification and its consequences*. Cambridge, MA: MIT Press.

Chandavarkar, P. (2002). *Crafting the public realm: Speculations on the potential of open source methodologies in development by design*. Available from http://www.ThinkCycle.org

Ford, E. R. (1990). *The details of modern architecture*. Cambridge, MA: MIT Press.

Foucault, M. (1994). *The order of things: An archeology of the human sciences*. New York: Vintage.

Frampton, K. (1995). *Studies in tectonic culture*. Cambridge, MA: MIT Press.

King, R. (2000). *Brunelleschi's dome*. New York: Walker and Co.

Kranakis, E. (1997). Designing the chain bridge. In *Constructing a bridge* (pp. 39-59). Cambridge, MA: MIT Press.

Lipartito, K. (1995). *Culture and the practice of business history*. Houston, TX: University of Houston.

Nullens, G. C. H. (2003). *An outsider's view of freemasonry*. Available from http://www.nullens.org

O'Connor, A. (1989) *Raymond Williams: Writing, culture, politics*. Oxford, UK: Basil Blackwell.

Raymond, E. S. (2001). *The cathedral and the bazaar*. Cambridge, MA: O'Reilly.

Rosen, H. (1999). *Construction specifications writing*. New York: John Wiley.

Saalman, H. (1980). *Filippo Brunelleschi: The cupola of Santa Maria del Fiore*. London: A. Zwemmer.

Saussure, F., de. (1983). *Course in general linguistics*. London: Duckworth. (Original work published 1959)

Scott, J. (1984). *Specification writing: An introduction*. London: Butterworth.

Semper, G. (1989). *The four elements of architecture*. Cambridge, UK: Cambridge University Press.

Stitt, F. (1999). *Construction specifications portable handbook*. New York: McGraw-Hill.

Webster's third new international dictionary. (1969). Springfield, MA: G. & C. Merriam & Company.

Williams, R. (1998). Base and superstructure in Marxist cultural theory. In R. C. Davis & R. Schleifer (Eds.), *Contemporary literary criticism* (4th ed., pp. 489-501). New York: Longman. (Original work published 1973)

Williams, R. (1976). *Keywords: A vocabulary of culture and society*. New York: Oxford University Press.

Willis, C. J. (1997). *Specification writing for architects*. London: Blackwell Science.

WordNet 2.1. (n.d.-a). Craft. Retrieved December 29, 2006, from Dictionary.com Web site: http://dictionary.reference.com/browse/craft

WordNet 2.1. (n.d.-b). Specification. Retrieved December 29, 2006, from Dictionary.com Web site: http://dictionary.reference.com/browse/specification

Scott Francisco is a designer and practicing cultural theorist and is currently a senior consultant at DEGW North America in New York. His SMArchS thesis at Massachusetts Institute of Technology School of Architecture and Planning, titled *Useable Space*, examines the "architectural nature of culture"—how culture operates as an infrastructure and how we operate on it. He has designed and built extensively in Canada and the United States and has taught at the University of Kentucky College of Architecture.