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Publication date
2023

Document Version
Final published version

Published in
Perspectives on Tacit Knowledge in Architecture

Citation (APA)
Avermaete, T. P. L., Buchert, M., Gosseye, J., & Havik, K. M. (2023). Tacit Knowledge in Architecture, A Quest. In *Perspectives on Tacit Knowledge in Architecture* (pp. 3-13). TACK Publishing Platform.

TACK

Perspectives on Tacit Knowledge in Architecture

This book offers a series of perspectives on tacit knowledge in architecture, hidden between the lines of text, lines of a drawing, and lines manifest in the built environment. The essays encapsulate three years of discussion and collective reflection across architectural practices, cultural and academic institutions. As a whole, they present a kaleidoscopic view of tacit knowledge in architecture as it unfolds from bodies, sites and identities; resides in models, drawings, reflections and senses; and builds new communities of practice.

Tacit Knowledge in Architecture, A Quest

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ROOMS	Library
OBJECT TYPES	TACK Book
FORMS OF TACIT KNOWLEDGE	Communities of Tacit Knowledge, Personal Knowledge

Introduction

Figure 0.1: Philibert Delorme, The Good Architect, Premier Tome de l'architecture, 1567.

The concept of 'tacit knowledge' was formulated in 1958 by the Hungarian chemist and philosopher Michael Polanyi. [1] Polemical in nature, it was part of an effort to refute the idea that scientific knowledge can be reduced to closed sets of statements or logical propositions. For Polanyi, scientific knowledge implied a worldly commitment on the scientist's part, manifest in the artisanal aspects of constructing experimental installations that involve the mastery of embodied non-explicit knowledge, or 'tacit ways of knowing'. Beyond the mere mastery of technical skills, tacit knowledge could, in Polanyi's view, also be found in the beliefs and traditions shared by a community of scientists. Generally transmitted in non-verbal form, these beliefs and traditions, Polanyi held, constitute the basis from which explicit knowledge can emerge, and explain why one always knows more about a particular subject than one can put into words. Polanyi thus positioned tacit knowing in between an idea of 'embodied knowledge' and '[socially] shared knowledge' that remains unspoken.

1. Michael Polanyi, Personal Knowledge: Towards a Post-Critical Philosophy (Chicago: University of Chicago Press, 1958).

In architectural culture, the question of which knowledge architects hold and activate is an old one. The Roman architect Vitruvius summarised the architect's knowledge as a pairing of fabrica and ratiocinatio (artisanal producing and reasonable consideration). [2] In the sixteenth century, the French architect Philibert Delorme maintained in his Premier Tome de l'architecture (1567) that architects rely not only on theoretical wisdom, but also on technical and worldly know-how acquired through experience. [3] Delorme illustrated this with his famous allegories of the 'bad architect' and the 'good architect'. While the bad architect has no eyes, hands, or ears, and is thus deprived of any visual, tactile, or auditive apprehension of the world, the good architect has three eyes, four hands, and four ears. The eyes stand for a process of visual learning from both past and present, and the architect's four ears and four hands respectively represent knowledge attained by pondering the counsel of others and knowledge attained by practising a craft.

Despite the importance attributed to non-explicit wisdom, the field of architecture has maintained an ambiguous relationship with tacit knowledge. Although architects, architectural theoreticians, and historians have acknowledged the importance of tacit knowledge in architectural culture – from the initial phases of the design process, over the different phases of the construction process, to the experience of a building – they often situate it within discourses on the 'artistic' registers of the discipline, the 'genius' of the architect, or the 'symbolic' dimensions of the built environment. Thinkers like the nineteenth-century German philosopher Friedrich Theodor Vischer, for instance, have defined architecture as a 'symbolic art' that cannot express its inner function directly but only through codified exterior elements. [4] Vischer equated the immediate architectural expression with the 'body' (Leib), and the tacit ideas underpinning architecture with the 'mind' (Geist). For Vischer, in other words, the tacit knowledge of architecture was part of an

2. Vitruvius starts his famous treatise, De architectura, by claiming that 'the architect should be equipped with knowledge of many branches of study and varied kinds of learning', and that this results from a combination of fabrica and ratiocinatio. See Vitruvius, The Ten Books on Architecture, trans. M. H. Morgan (New York: Dover Publications, 1960).
3. Philibert Delorme, Le premier Tome de l'Architecture (Paris: Federic Morel, 1567).
4. Friedrich Theodor Vischer, Ästhetik oder Wissenschaft des Schönen (1851), ed. Robert Vischer, vol. 3 (Munich: Meyer & Jessen, 1922), 234.

impenetrable symbolic inner reality. This ascription of tacit knowledge to artistic or symbolic perspectives has prevented it from becoming the subject of in-depth critical research in architecture. Despite its centrality in architectural education and practice, tacit knowledge has largely remained a terrain vague when it comes to scholarly architectural reflection. This book accordingly includes ten critical essays that address fundamental questions concerning the character of tacit architectural knowledge, the way that it performs in the discipline, and how it affects architecture culture.

Figure 0.2: Philibert Delorme, The Bad Architect, Premier Tome de l'architecture, 1567.

The Character of Tacit Knowledge

The first series of questions that several contributions in this book address concerns the very character of tacit knowledge in the field of architecture. In architecture culture, tacit knowledge appears in many modes and has many different faces. A first important mode is 'embodied knowledge'. Architects not only gather knowledge through textual learning, but also through bodily apprehension. In architectural design education, the idea of 'learning by doing' within a studio environment is vital. As architectural scholar Thomas Dutton has argued, 'compared to typical classroom scenarios, studios are active sites where students are engaged intellectually and socially, shifting between analytic, synthetic, and evaluative models of thinking in different sets of activities (drawing, conversing, model-making)'. [5] In most programmes of architectural education students learn by drawing (in analogue or digital fashion), by building (scale models or mock-ups), and by writing (texts or data scripts). Design theorist Donald Schön speaks of a 'knowing-in-action implicit in

5. Thomas A. Dutton, "Design and Studio Pedagogy," Journal of Architectural Education 41, no. 1 (1987): 16–25.

architecture making'. [6] Accordingly, he considers the architectural design process a 'reflective practicum' in which disciplinary knowledge is produced through 'reflection-in-action'. [7] These perennial practices of drawing, building, and writing – typical of the educational modus operandi of the studio, but also characteristic of the work undertaken in design offices – as well as the various modes of 'reflection-in-action', are methods of knowledge production and accumulation.

Next to embodied knowledge, tacit knowledge in the field of architecture is also a fundamentally social matter. Within a design office, architects often share a set of unspoken ideas and values. This knowledge is often implicit, to be read 'in-between the lines' of, for instance, shared frames of reference for specific building details or plan layouts. This is why educational theorist Etienne Wenger claims that the design office can be described as a 'community of practice'; a set of architects that form a group not only because they work in the same place or for the same company, but also because they share a specific set of tacit knowledge. [8] In architectural culture, such communities of practice not only exist within the design office, but can form between architects and craftsmen, or between architects, engineers, and commissioners, etc.

The quintessential example of such a community of tacit knowledge is the studio in architectural education. [9] This mode of design education, whereby groups of students work with dedicated educators, was introduced in the nineteenth century when the classical atelier system of the French Royal Architectural Academy transformed into the Ecole des Beaux-Arts. The atelier in the Beaux-Arts programme not only aimed to improve students' 'artistic'

6. Donald A. Schön, "The Architectural Studio as an Exemplar of Education for Reflection-in-Action," Journal of Architectural Education 38, no. 1 (1984): 4.
7. Ibid.
8. Etienne Wenger, Communities of Practice: Learning, Meaning, and Identity (Cambridge: Cambridge University Press, 2008).
9. For a good introduction to the studio as a mode of architectural education, see Guy Lambert, "La pédagogie de l'atelier dans l'enseignement de l'architecture en France aux xixe et xxe siècles, une approche culturelle et matérielle," Perspective (2014), https://doi.org/10.4000/perspective.4412.

proficiency, but also their 'analytical and structural thinking skills'. [10] In spite of the radical changes in educational programmes, the centrality of studio education was maintained in subsequent pedagogical programmes such as the Bauhaus. Walter Gropius, its founder, maintained that 'the school should be absorbed into the studio and that the manner of teaching should arise from its character'. [11] Typical of the studio is that knowledge is socially constructed. In the shared space of the atelier or studio, students construct a collective base of tacit knowledge as well as an individual position by observing, positioning, and acculturating the work of others, both professors and fellow students. The studio is a system of shared learning, in both a very practical (hands-on) and a cerebral manner.

The Vectors of Tacit Knowledge

Examining tacit knowledge in architectural culture also invites us to reflect on the various ways in which tacit knowledge is transmitted, the second area of enquiry addressed in this book. If knowledge is not passed on through texts, formulas, or manuals, what are the vectors by which knowledge is disseminated?

In architecture, the question of disseminating tacit knowledge points first and foremost to the tools and instruments that are at the very core of the discipline: the ways in which sketches, perspectives, and plans pass on architectural wisdom. The way in which these drawings transmit non-explicit knowledge has long been a subject of reflection in the field of architecture. At the end of the sixteenth century, Federico Zuccari, in his well-known work, L'idea de' Pittori, Scultori et Architetti, already theorised the existence of a disegno interno, an inner drawing, and disegno esterno, an external drawing. [12]With the external drawing, Zuccari refers to the representation of a building or a city based on explicit conventions and codes of drawing (i.e., the rules of the perspective or axonometry). He complemented this with the concept of inner drawing, which he characterised as a category of knowledge embedded

10. Arthur Drexler, The Architecture of the Beaux-Arts (London: Secker & Warburg, 1984), 92.
11. Walter Gropius, "The Bauhaus," Architectural Education 1 (1983): 53–79.
12. Federico Zuccari, L'idea de' pittori, scultori et architetti (Turin: 1607), reprinted in Scritti d'arte di Federico Zuccaro, ed. Detlef Heikamp (Florence: L. S. Olschki, 1961).

in the drawing that travels with it but which is not necessarily visible from the outside. Zuccari believed that the external drawing could attempt to represent the ideas of the inner drawing but never fully coincide with it. With his concept of disegno interno, Zuccari recognised that the traditional representational tools of architecture – such as the sketch, drawing, and scale-model – transmitted vital architectural knowledge that could not be deciphered through explicit codes or conventions of drawing. The knowledge of the disegno interno is accumulated by looking at examples, role models, ideas, and ideals transmitted by lectures, photos, storytelling, travelling, exhibitions, etc. To this day, the search for other forms of enquiry and theoretical frameworks to explore the knowledge of the disegno interno remains a challenge for architectural scholars.

Another key aspect of the transmission of tacit architectural knowledge are artefacts, such as construction elements, furniture pieces, buildings, urban landscapes, etc. Such artefacts are not just vectors but 'material witnesses' of tacit knowledge. [13] The tacit knowledge that artefacts can hold has, however, not yet been explored in great depth in the field of architecture. Scholars have felt more comfortable analysing textual and visual sources, leaving the tacit knowledge of the artefact largely untouched. Architecture researchers are thus still searching for approaches and methods to grasp this particular artefactual knowledge. Architecture scholars are still grappling with questions such as how to capture knowledge that is silently embedded in an architectural artefact, and how does one analyse the embodied concepts that artefacts can articulate?

Architectural knowledge is not only embedded in inanimate tools, instruments, and artefacts, but also in craftspeople, builders, designers, architects, etc. These professionals possess embodied professional knowledge shaped through time and experience. Through actions such as drawing, building, writing, observing, and talking, they construct a foundation of tacit, embodied knowing that is not just individual, but collective, as it is often co-

13. For the notion of 'material witness', see Susan Schuppli, Material Witness: Media, Forensics, Evidence (Cambridge, MA: MIT Press, 2020).

constructed with others at the design office, craft workshop, or building site. This knowledge residing within the architect, designer, or craftsperson is, however, challenging to investigate and analyse. How can a researcher who is not part of the design office, or not a collaborator in a construction project, grasp such knowledge? What analytical strategies, tools, and concepts do we have to probe this embodied silent knowledge? These remain important questions for researchers interested in architectural design and construction.

The Status of Tacit Knowledge

A third series of questions addressed in the essays gathered in this book relates to the status, roles, and effects of tacit knowledge, especially concerning other types of knowledge, and its production. As mentioned earlier, tacit knowledge has always had – and still has today – an ambiguous status in architecture culture. Although those who teach architecture are convinced of the key role that tacit knowledge plays in learning architectural design, an international trend of explicating pedagogical systems and programmes to rationalise educational processes can be observed. The same can be said for architectural practice, which increasingly needs to respond to a growing set of technical and economic requirements that push the design process to become more rationalised and rule-driven. In short, architectural design is increasingly conditioned by explicit norms and standards. What status does tacit knowledge have within such a context? What role can tacit architectural knowledge play in relation to the dominance of various sorts of explicit knowledge? One might assume that, in such circumstances, the status of tacit knowledge is reduced to an absolute minimum. The opposite, however, is true. In a period in which rational and explicit knowledge seems to dominate architectural culture, a renewed interest in the tacit dimension has emerged. Architects have become very aware of the importance of tacit knowledge in architectural education and design practice.

This renewed attention paid to tacit knowledge can be attributed to the growing opposition to Western hegemony, which for a very long time promoted rational and explicit reasoning as the only valid approaches to

understanding the world. [14]In architecture, this idea of the explication and rationalisation of knowledge has accompanied the development of architecture throughout the twentieth and twenty-first centuries. Even in those studies that have focused vocally on embodied understandings of the built environment – think, for instance, of Kevin Lynch's The Image of the City (1960) – explicit rationalisation (in the form of diagrams, patterns, or texts) is used. Other ways of knowing that do not take explicit reason as the source of insight have often been disqualified and, through strategies of marginalisation, belittlement, and suppression, erased from canonical architectural thinking.

For a long time, architectural critics, historians, and theoreticians did not fully acknowledge the importance of corporeal, imaginative, and intuitional faculties in knowledge production. These faculties were separated from explicit 'rationality' and attributed to the artistic (and thereby less important) registers of architecture culture. Today, however, there seems to be a growing belief that architectural knowledge entails more than explicit observation and reasoning. Such a perspective raises questions of how to conceptualise these other, more implicit, ways of knowing. Notable attempts to articulate more precisely what the status and capacity of such knowledge might be include Donald Schön's writing on 'the reflective practitioner', Nigel Cross's book on 'designerly ways of knowing', and Richard Buchanan's work on 'design thinking'. [15]

The renewed interest in tacit knowledge can also be regarded as an attempt to move beyond dominant Western techno-scientific approaches to knowledge production. It is an invitation not only to recuperate the marginalised tacit dimensions of architecture culture, but also to widen our conceptions of knowledge production beyond Western (colonial) intellectual regimes. As an alternative, the philosopher Nelson Goodman proposes 'worldmaking',

14. For this evolution, see, for instance, N. Maldonado-Torres, "On the Coloniality of Being," Cultural Studies 21, nos. 2–3 2007): 240–70.
15. Donald A. Schön, The Reflective Practitioner: How Professionals Think in Action (New York: Basic Books, 1983); Nigel Cross, Designerly Ways of Knowing(Basel: Birkhäuser, 2007); Richard Buchanan, "Wicked Problems in Design Thinking," Design Issues 8, no. 2 (1992): 5–21.

understood as a mode of knowledge production 'beyond theories and descriptions, beyond statements, beyond language, beyond denotation even, to include versions and visions metaphorical as well as literal, pictorial and musical as well as verbal, exemplifying and expressing as well as describing and depicting...' [16] Goodman underlines that from this perspective, knowledge production is less about explicit rationality and more about 'rendering' and 'rightness'. For him, 'rendering' includes not only what a draftsman does, but all the ways of making and presenting worlds – in scientific theories, works of art, and versions of all kinds. [17] By 'rightness' he refers, along with truth, to standards of acceptability that sometimes supplement or even compete with truth. [18]

Examining fundamental questions concerning the character of tacit architectural knowledge, and the way that it performs and affects architecture culture, this book is thus also a quest to explore various modes of worldmaking in architecture culture. In foregrounding other ways of knowing, it also foregrounds other traditions of gathering knowledge, and welcomes different methods and heuristic approaches in the study and practice of architecture.

The contributions to this book are grouped into three sections. The first section, entitled 'Dramaturgies', gathers four papers that explore architectural culture's relationships to material, the body, workmanship, and care. Eric Crevels's contribution studies the role of craftmanship in architectural practice, dealing with insights from anthropology regarding the role of skill in epistemologies of making. In this transdisciplinary encounter, tacit knowing is discussed as sensual lived experiences of skilful interaction with different materials in real, productive settings. Anna Livia Vørsel's essay shows how knowledge is present in material, and how stories are embedded in their use and life cycle. Material choices, Vørsel maintains – through their textures, temperatures, moisture, etc. – not only influence how individuals experience

16. Nelson Goodman, Ways of Worldmaking (Indianapolis: Hackett Publishing Company, 1978), 109.
17. Ibid.
18. Ibid., 110.

architecture, but also have an impact on the social aspects of architecture and the culture of its maintenance. Building on the notion of embodied experience, Mara Trübenbach speaks of material literacy, and connects materiality to the imaginative capacity of architects. Using insights from the performative arts, she investigates how embodied impulses, related to materiality, steer processes of architectural imagination in the context of a design process. Paula Strunden takes the interest in the performative aspects of architectural perception into the realm of extended reality, exploring possibilities of new media. To uncover different layers of spatial experience, she probes and discusses these quests by constructing 'autonomous' model installations as interweaving hybrid environments, stimulating interactions with perceivers as actors.

The three essays gathered in the next section, entitled 'Communities', explore the formation and existence of communities of tacit knowledge in the field of architecture: how practices (of architects) come with their own ways of doing, from positioning and communication to ways of approaching sites, assignments, and design processes, and the cultural trajectories they imply and generate. Claudia Mainardi discusses the codes that exist in architectural practices, regarding these as 'the mode in which values and principles materialise'. Such codes – think, for instance, of the jargon that develops in cultures of practice – imply the existence of multiple registers of tacit knowledge that become part of the DNA of architectural practices and of the cultural 'milieu' and debates of which they are a part. Caendia Wijnbelt's contribution shows how these codes and ways of communicating about architecture can depend on different cultural, educational, and geographical backgrounds, by describing the different 'pathways of interpretation' of a public building in Bruges, Belgium, co-designed by the Portuguese architect Souto de Moura and the Belgian architecture firm META. Wijnbelt's essay discusses how the different perspectives on the topic of locality affected the collaborative process of design, the shape of the architecture, and the possibilities of its perception. Finally, Filippo Cattapan's essay focuses on the creative practice of the Belgian architect Christian Kieckens, and looks particularly at the role that visual knowledge played in his office and teaching,

as well as in his exchanges with various European and American architecture contexts.

The last set of contributions gathered under the heading ‘Situations’ dwell upon the situations that architects encounter that may call for very different forms of tacit knowing. Ionas Sklavounos presents a highly situated approach in which local communities and local building traditions are brought into play in the development of site-specific projects; in this case a stone masonry project in Greece. Dwelling on insights from phenomenology, he recognises the potential of poetic animation and the emergence of stories in these actions taking place as a collaborative process between craftspeople and architects on site. As Jhono Bennett explains in his contribution, instances of tacit knowledge in architecture may also be intrinsically related to geographical and political situations, such as in the case of architectural and urban practice in South Africa. Bennett explains how traces of political history are still tacitly present in architectural culture and ponders whether a ‘reparative practice’ could emerge through the quest for more specific ‘southern values in spatial practices’. The final essay, by Hamish Lonergan, speaks of a very particular situation that all architects encounter during their training: the design studio. In this setting, codes and conventions of architectural cultures are implicitly taught, and it is through these situations that future architects develop the shared social values that they will take with them tacitly and explicitly on their trajectories of architectural practice.

SECTION 1: DRAMATURGIES

FORMS OF TACIT KNOWLEDGE	Embodied Knowledge, Enacted Knowledge, Situated Knowledge
GLOSSARY TERMS	Care, Craft, Embodiment and Experience, Material Culture

Coarse epistemes: Skill, craftsmanship and tacit knowledge in the grit of the world
Eric Crevels

DATE	November 1, 2022
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