

Primed Figures — Reimagining Architectural Drawings as Technological Mediators

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ABSTRACT

The architectural drawing is essential to processes of the production of the built environment. In this article the architectural drawing is examined through an Actor-network theoretical lens and reimagined as a technological mediator. Drawings seen as technological mediators are actors, that effect the force they transmit, and that can be described by treating their effects as technological. These effects are defined as four specific types of mediation and their relevance for understanding the nature of architectural drawings is explained and illustrated. The potentials for change in the processes of the production of the built environment are described as a conclusion.

Introduction

At the origin of the architectural drawing is the transformation of space and time, or distance and duration by technological means. The wishes of a patron are translated by a builder into instructions for other builders and laborers, the instructions are further transformed into documents, architectural drawings (Figure 1.). The drawing gives the instruction duration, far beyond the duration of the vocal message and its reverberation in the memory of the recipient. The drawing also separates the builder from the site of construction, turning them into an architect and bridging the distance between them and the site. The drawing transports the different features and qualities of the site to her table, in the form of graphic representations to be manipulated and worked with. The architectural drawing is an essential mediating actor in all this—not just a transparent medium carrying passively concepts and ideas, but an actor in its own right.

This paper argues that the way drawings participate in the assembly of the built environment is not restricted to the typical description of their role as “a sketch, diagram, plan, or schematic used to design, construct, and document buildings and

other structures” (Society of American Archivists, 2023), but it can be best understood as a form of mediation in the sense used in Actor-network theory (ANT) accounts of phenomena (Latour, 2005). Drawings are acting as mediators in networks of actors, being more than neutral intermediaries between for example an architect and a builder (Latour, 2005). For describing what kinds of mediating effects drawings can have, this paper argues that by treating these effects as technological, we are able to give them general outlines, that allow for a reimagining of their nature and their role within the networks of the production of the built environment, thus opening up opportunities for change. For this, the vocabulary of Science and Technology Studies (STS) can be deployed and used (especially Akrich & Latour, 1994; Latour, 1999), and a set of specific types of technological mediation suited for architectural drawings described.

The description of drawings as technological mediators is presented by first describing the processes of the production of the built environment through an ANT lens. This is done by discussing the specific qualities of ANT readings and the importance of tools in relational accounts of processes. The roles which the architectural drawing can take

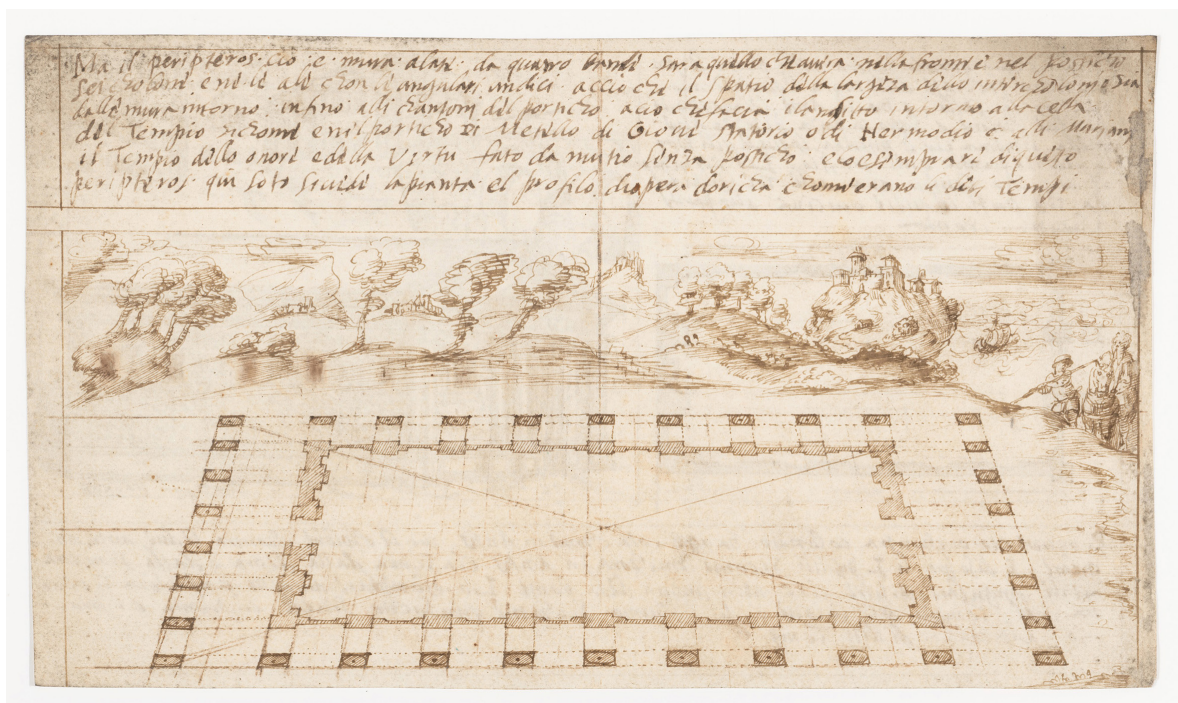


Figure 1. A perspective of a landscape, with an architectural plan overlaid on the ground and outlining an edifice to be built (A member of the Sangallo Family, c.1530–1545).

on are outlined, and the difference between treating drawings as neutral intermediaries or active mediators is highlighted. Also, previous ANT-based descriptions of drawings are reviewed, and their different aspects discussed. Second, a description of architectural drawings as technological mediators is proposed, by first discussing the positions of drawings within the networks of processes of production of the built environment through the concept of distributed competences, and then, by specifically describing drawings through the different technological qualities they exhibit when participating in these networks. These qualities form the conceptual tools for analyzing architectural drawings as mediators. Third, the effects of drawings partaking in an architecture project (the Myllykoski Parish Center) are described by using these tools, and lastly, the implications and possibilities that come into view when drawings are reimagined as technological mediators are discussed.

The article confines itself to a selection of definitions of technological mediation directly related to ANT/STS, and specifically expressed by Latour. Thus, the likewise relational viewpoints articulated by postphenomenology (e.g. Rosenberg & Verbeek, 2015) and Object-oriented ontology (e.g. Harman, 2009) are excluded, even though both are relevant regarding technological mediation and architectural production respectively; they provide different theoretical frameworks and points of departure for further study.

The Processes of the Production of the Built Environment seen through an ANT lens

The production of the built environment can be described in several ways—as the interplay between materials, engineering, and concepts (Frampton, 1992; 1995), competing ideas and visions (Hall, 2014), or as the slow working of impersonal forces (as in the case the "organic" patterns discussed in Kostof, 1999, or the role of energy and fuel, as in Calder, 2021)—most descriptions of this kind rely on quite specific framings. For a description that encompasses all the human and non-human elements, an Actor-Network Theory (ANT) approach (Latour, 2005) can be adopted. It provides us with a sufficiently rich portrayal of the production of the built environment, not prioritizing any elements over others.

The indiscriminate admission of all kinds of actors (Latour, 2005), and applying ANT's ontological premise of flatness (Latour, 2005), permits us to explore a network of, among other things, the materials, technologies, architects, builders and occupants, as well as the legal, contractual and discursive elements that take part in the production of our built environment without prejudice. A practically unlimited web, that can account for producing the built environment—with revelations of more or less important actants, according to the strength of their associations (Latour, 1987), and their corresponding positions in the network.

ANT has been seen as an appropriate framework for approaching urban and architectural questions, recent examples concerning urban studies have been collected in Bender and Farías (2010); concerning architecture, and architectural practice in Yaneva (2022); and Dılaveroğlu et al. (2021) have provided a review of recent examples in architectural studies. However, the networks of actors relevant to the processes of the production of the urban built environment, with a focus on the role of drawings and their effects have not been studied before, and therefore this paper aims to provide conceptual tools for seeing anew some of the ways in which our environment is being designed and built.

ANT and its usefulness have been criticized on several fronts, and the sympathetic overview provided by Fallan (2008) on ANT's uses in architectural research compiles several pointed challenges to the use of ANT that need to be taken into account: Especially the symmetrical approach to humans as well as non-humans and the seeming focus on the surface of things and interactions, and thus a perceived devaluing of issues of culture or power (2008). These arguments have been answered through demonstrations about the meaning and role of non-humans in our interactions (e.g. Latour, 1994) and with the argument that also power relations and structures of domination must be produced and composed (e.g. in Latour, 2005; Law, 1991).

A criticism which is especially relevant for this paper has to do with the open-ended and agnostic nature of ANT. The actors and their relations are revealed through a careful accounting of their circulation, not before. An approach that takes as its starting point a type of actor (the architectural drawing) in a certain relational network (the processes of building) may seem antithetical to

ANT, as ANT is focused on relations and becoming instead of substances or predefined identities and definitions. Here the approach is defended based on the institutional character of the positions of architectural drawings. They have in many cases quite strict formal requirements and relational ties to established processes—this is why we can discuss them in a general way, as actors that are to some extent already known, within a system that is partially also visible, not unlike a social infrastructure of building. This is also why only architectural drawings are discussed in depth, as other objects and tools in the processes of the production of the built environment, like different types of models, do not have the same institutional position(s) and attachments. The article thus aims to provide a fuller description of the technological mediation provided by architectural drawings entangled already in their known relations, and not describing the phenomena of building starting from scratch.

The Importance of Tools

A relational reading of the production of the built environment highlights the importance of architectural tools, as both human and non-human actors are accounted for, but neither is given precedence at the outset, i.e. a reading of materialistic causation or the designating of a creator is not provided. Here the term non-human refers to any and all other actors than humans, that partake in a process—objects, things, drawings, and so on; where the impossibility of strict a priori categories is explored in Latour (1999). Different types of architectural artefacts occupy a variety of locations in the configurations of designing and building: rough massing models of crumpled paper and Styrofoam, sketches of indeterminate scale, detailed plans with measurements and notations, perspective renderings illustrating possible futures—all are nexuses of distinct associations.

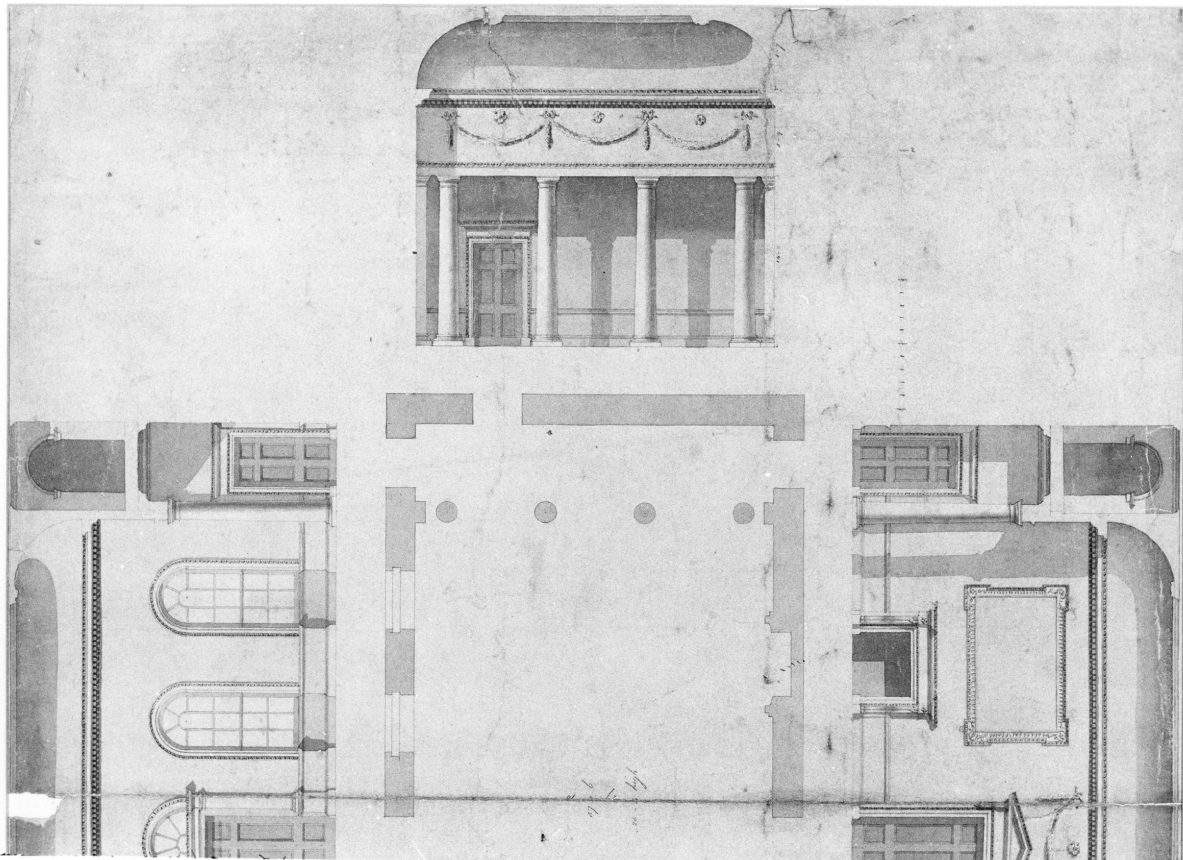


Figure 2. Example of a developed surface drawing, showing the section and ground plan of a hall (Adam, 1728-1792).

In addition to the flatness and mapping of networks of an ANT description, an additional imperative trait of the method, is seeing the actors in the network as mediators, i.e. they always affect and transform the meaning or force that they transport, where “[t]heir input is never a good predictor of their output; their specificity has to be taken into account every time” (Latour, 2005, p. 39). The mediator is opposed to the concept of an intermediary, that would only transport force, without transformation.

The role of the Architectural Drawing

The qualities of architectural drawings have been typically discussed as indices of the process of design, for example intermediate sketches (Goldhagen, 2001); as abstractions amenable to formal analysis (Rowe, 1987); and as media-matter transporting and circulating architectural concepts (Mir et al., 2013). The architectural drawing presents itself to us often immediately as an image, a representation, but to discuss the architectural drawings just as data or artifacts for analysis (Groat & Wang, 2013), or even as media productions, through the sites at which the meaning of an image is made or the modalities of these sites—as approaches to visual methodologies would have us do (Rose, 2016) would be reductive. This would be only a partial description, turning its focus away from the effects of the drawing itself—in effect, treating it as a transparent intermediary instead of a transforming mediator.

The Architectural Drawing as a Mediator

Close readings exploring the nature and meaning of different types of drawings have been produced, most prominently studies exploring the perspective drawing, vis-a-vis modes of thought (Panofsky, 1991), or architectural form-giving (Pérez Gómez & Pelletier, 1997). These are thorough examples of archaeologies of representational forms, but detached from the multifaceted and contingent roles drawings occupy within the processes of the production of the built environment.

The effects that the architectural drawing has as a mediator in these processes have been explored by several authors – extensively by Robin Evans, especially in his essay on the developed surface drawing type (an example is shown in Figure 2.) that has directed the design and use of interiors

(Evans, 1997), and on the interplay of drawing and geometry (Evans, 2000). Evans provides historical overviews, while other authors, like Ewenstein and Whyte present more particular cases of working with aesthetic knowledge through the act and modes of drawing (2007), and the qualities of drawings as boundary-, epistemic- and technical objects (Ewenstein & Whyte, 2009) in the process of design.

Architectural drawings and models studied with an explicit ANT framework have been discussed in the context of the potential nature of the drawing (Latour & Yaneva, 2017), competition processes (Jacobsen, Tryggestad & Harty, 2021), and the process of decision making through models in different scales (Yaneva, 2005), and site analysis (Tietjen, 2018). These examples offer an illuminating array of the different ways that architectural drawings function in the networks of architectural design. The limits of the ethnographic case study, and the focus on the event of design, however, confine the possibilities opened by these accounts. It is here argued that we should recognize the architectural drawing not as an image, or as an intermediary, or even as a circulating reference or inscription, etc. through an ANT reading, but as a technological mediator (Latour, 1999) embedded in the processes of the production of the built environment. Then we can describe its participation in a richer and more comprehensive way, and by this reimagining open up new opportunities for change in these processes.

The Architectural Drawing as a Technological Mediator

A description of drawings as technological mediators is here proposed, to provide us with conceptual tools for analyzing architectural drawings in the sense stated in the previous chapter. First, by discussing the concept of the distribution of competencies among human and non-human actors in socio-technological settings, and then by focusing on specific types of technological mediation that can be observed when dealing with drawings. These specific types are described using the different meanings of technical mediation used by Latour (1999). They provide a provisional list of varieties of technological mediation for the analysis of the roles and relations drawings may have within the processes of the production of the built environment. These types are conceptual tools for analysis, and their usefulness is demonstrated in the fourth section of the article.

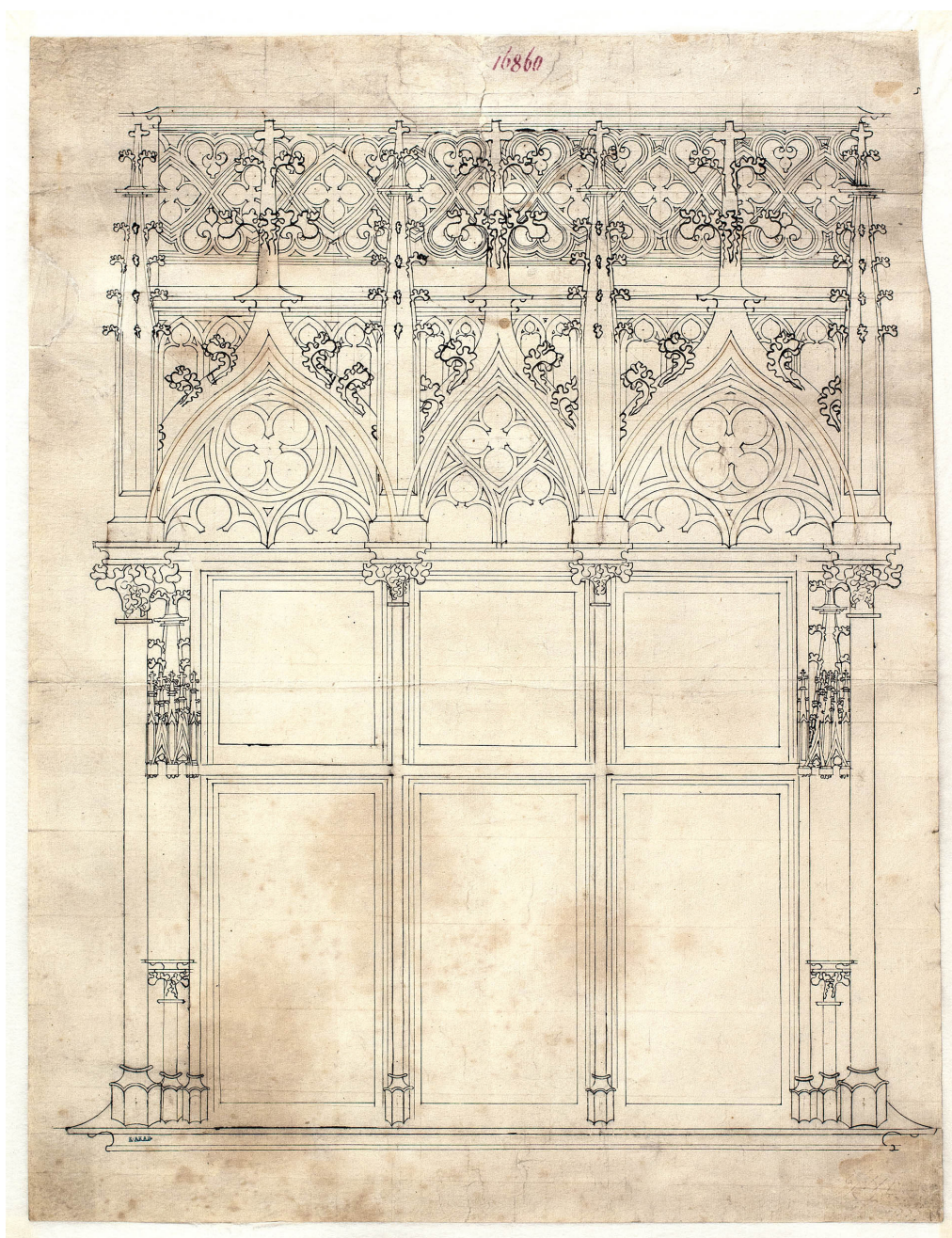


Figure 3. Figure 3. A gothic fragment (Spenning, 1456).

Distribution of Competences

Because nothing can be fruitfully analyzed in isolation, in this text our objects of study should be called most suitably settings, i.e. assemblies of human and non-human actors, within which different competences are distributed (Akrich & Latour, 1994). Competences can be shifted from human to non-human actors and vice versa in several ways (Latour, 1994), this gives us a useful starting point for considering the positions and relations of non-humans—for example architectural drawings—in

their settings of humans (h) and non-humans (nh). As an illustration, we can imagine how a traveler (h) who has crossed a landscape, can impart their knowledge to another (h) planning on making the same journey: they (h) can lead them (h) themselves (resulting in a purely social assemblage h-h); or impart their (h) knowledge as a map (nh) drawn on material to be carried in one's pocket, freeing the initial traveler and providing the second one with a non-human stand-in for his knowledge, an assemblage of a human and a non-human, where the competences have been redistributed (h-nh).

The concept of the distribution of competences among human and non-human actors in the processes of the production of the built environment can be traced through historical changes. A telling if extreme comparison can be made by comparing the assemblages of actors participating in the construction of mediaeval cathedrals and contemporary building works. As Spiro Kostof discusses, the building of Chartres Cathedral (2010) was the work of the whole City, from a wide base of patronage to the actual construction of parts, elements, and sculptures in the workshops, with the guilds of craftsmen playing a major part, but with no certainty of the name of the architect. The architectural critic Irénée Scalbert has described the role of the drawings in gothic architecture as secondary (2018)—the drawings that were made, used expensive sheets of parchment that were often washed and reused, and the building was never drawn in its entirety. Drawings presented only aspects of the whole (like the fragment seen in Figure 3.)—construction was guided by procedures and with a close affinity between the principles and tools employed physically on site—the competences distributed in the assemblage relying heavily on human actors. Presently the production of any project requires an immense proliferation of non-humans. The most mundane project requires a large number of drawings and artefacts—this speaks to the necessities inherent in achieving costing estimates, ensuring regulatory compliance, communicating common goals to all stakeholders and creating sites for coordination and the cross-checking of plans, amongst other things. The competences inherent in the processes of the production of the built environment have been redistributed, with now the lion's share in the non-human column, which makes paying them and their mediating effects due attention necessary.

Four Meanings of Technological Mediation

Some of the ways which drawings participate in these settings can be described now in more detail. Technological mediation (as portrayed in Latour, 1999) opens several different meanings of mediation, describing it in four ways as: 1. Interference—the shifting of goals, as all the actors share in the action; 2. Composition—action always as the property of an association of actors that enable the action; 3. Blackboxing—many of the artifacts partaking in action are themselves composed of several actors made invisible through convention and habit; 4. Delegation—the matter of expression is changed

through a shifting down, as a program of action is articulated with things. These different meanings can relate to the architectural drawing in various ways, helping us compose a general description of the architectural drawing as a technological mediator.

Interference

Human and non-human actors affect each other, they interfere in each other's goals and thus act as mediators, not intermediaries.

Interference when applied to the architectural drawing as a technological mediator, means that the tools we use participate in the processes of the production of the built environment, not just by enabling but also by inhibiting and directing our attention according to their qualities. We can illustrate this with an example of a process where interference—a shifting of goals – can be seen as the negotiation between patron and architect. The patron and their architect come to an understanding with the architectural drawing—the wishes of the patron and the inclinations of the architect are forged together in the drawing, that does not directly represent either's goals, but is a third partner, getting its voice heard through what it allows or prohibits in the process.

Architectural drawing types circumscribe and dictate the types of things they deal with, and so interfere in the possible goals or programmes of action other participating actors may have.

Composition

The goals reached by actions are the composite goals of the assemblage of human and non-human actors, the goals are reached only by associating a sufficiently robust network of humans and non-humans together.

Composition when applied to the architectural drawing as a technological mediator, means tracing the whole network that participates in the processes of producing the built environment and seeing drawings with their attachments in their context(s). As Jeremy Till has stated “[a]rchitecture depends” (Till, 2013)—this contingent quality of architecture reaches all the way to the role of architectural drawings, and this in turn allows for reconsidering the locations where differences can be made. In a typical situation, drawings are so conditioned, that

their type as well as possible expressive content is very circumscribed by for example the needs of the costing process or the requirements of the workshop where the drawings are heading next. Therefore, transformation of the production of the built environment may require not only a transformation described through the usual set of drawings, but also taking control of or at least into account a larger chain of actors. This is very well exemplified in cases where the manufacture of architectural elements is included in the design process (one overview provided in Kolarevic & Klinger, 2008).

Blackboxing

When an assemblage functions smoothly, it becomes an intermediary for us and we do not have to take its internal functions into account, it has been blackboxed (Latour, 1999). However, the black box becomes once again a mediator in cases of breakdown – the box opens, and the underlying association(s) are uncovered.

When Blackboxing regards the architectural drawing as a technological mediator this means seeing the black boxes that we are surrounded by. Blackboxing as a concept calls for criticality and the questioning of tools and processes seen as automatic, the invisible assemblages within assemblages. When considering technological mediation, the tools we use (from the simple, like our tools of hand notation, to the complex, like CAD software, and Geographic Positioning Systems) are easily taken for granted, but we can also include cultural norms or practices. The architectural drawing that relies for example on cultural assumptions can be seen as harbouring black boxes of presumed things. Often the black box only opens and becomes visible through a challenge or breakdown, a recent example within architecture being the issue of public bathroom design regarding shifts in how gender is experienced and perceived (Sanders, 2017).

Delegation

Delegation happens when a redistribution of competences in an assemblage results in a change in the matter of expression. As an example, the “slow down” command of the human policeman is translated into a non-human speed bump in the road (Latour, 1999, p. 186). Delegation is a “shifting down”, where things are taking the place of signs (Akrich & Latour, 1994, p. 260).

Delegation regarding the architectural drawing as a technological mediator means a switching down of our verbal wishes and commands to drawn or written instructions. In its most basic form, the architectural drawing is an embodiment of instructions, a new link in the chain, coming between the face-to-face interaction between two builders, the other guiding the other. One can argue that the meaning of delegation also explains the moment in history where the craft of building becomes architecture, creating a split in the form of the drawing between the architect and the craftsman, who had before worked as one. In Jonathan Hill’s characterization: “The architectural drawing established a new etiquette of communication between the various parties involved in architecture” (2002, p.17).

Often the processes of production demand delegation to specific types of drawings on the grounds of economy and regulatory oversight, but by re-examining and challenging these necessities, other paths for producing the built environment may open up—the rich mesh of personal instructions, physical acts and explanations through words and drawings involved in Sigurd Lewerentz’s work on the Sankt Petri church in Klippan, Sweden (1968) is here instructive as an alternative to contemporary practice (the interplay of the human and non-human actors is well described in Foote et al., 2021).

An Illustration: Architectural Drawings as Technological Mediators

The effects of technological mediation, described in the previous chapter in general terms, can be illustrated by discussing the effects of actors partaking in different phases of a specific architectural project: here we use as an illustration the Myllykoski Parish Center (OPUS Architecture, 2020) in Kouvola, Finland. The project has been chosen by its qualities as a representative building process in several phases. The aim of the illustration is to apply the conceptual tools of interference, composition, blackboxing and delegation to a concrete case and show what kinds of insights can be gained by this. The concepts are used one by one on specific phases for clarity, but a comprehensive analysis would of course find a lot of simultaneity and overlap.

The Myllykoski Parish Center was first conceived of as a public competition for an extension to the Myllykoski Church (Kouvolan seurakuntayhtymä, 2016a). The winning entry led to a new detail plan

and permit documentation. Before and during building, more detailed drawings for costing and construction were drafted. The material spanning these phases constitutes the material for this illustration and the phases are used to highlight instances where the use of concepts of technological mediation provides insights beyond conventional descriptions.

Competition proposal: Interference

The competition program lists the goals for the project and the drawings to be submitted for review (Kouvolan seurakuntayhtymä, 2016a). The types of drawings required (site plan, floor plan, section, projection, perspective) have been naturalized on the one hand by the conventions of architecture competitions, and on the other by the position of the competition proposal in the processes of the production of the built environment—preceding a set of building permit documents. The drawings force certain types of expression (as seen in Figure

4.)—agreed on notations that provide the framework within which designs have to be described.

The documents are a translation of the stated goals, while interfering with them – as can be seen by comparing the competition programme and the jury’s report. While the programme focuses on the goals to be reached in terms of the aspirations the client has of the future regarding the vitality of the area and the different activities and happenings that the project may provide the space for (Kouvolan seurakuntayhtymä, 2016a), the jury’s report working on the basis of the drawings, describes and evaluates only the architectural qualities of the winning proposal “Triadi” (Kouvolan seurakuntayhtymä, 2016b, p. 12). In the process of the transformation of more abstract goals through drawings to a set of spatial and formal qualities, the drawings modify these goals and bring completely new aspects to light. We are dealing with the interference that the drawing types effect, as frames for the designs.

Permit Documentation: Composition

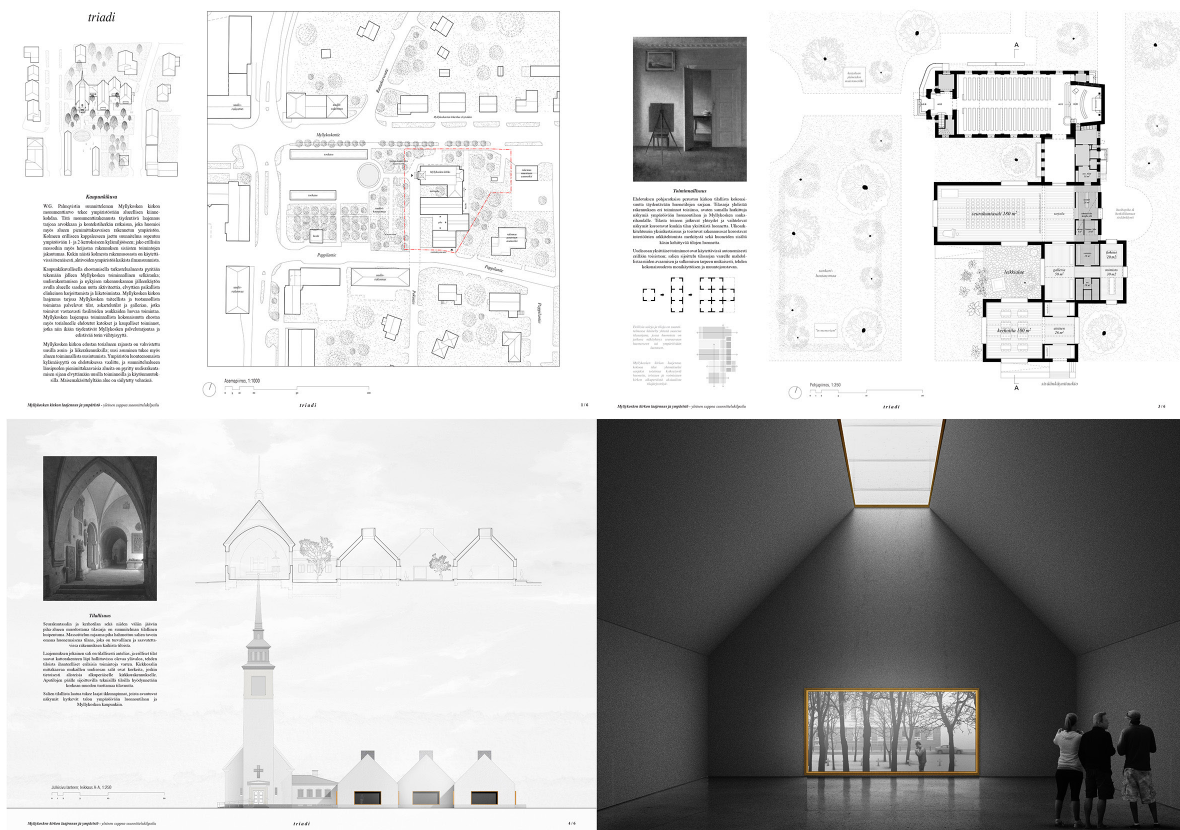


Figure 4. Competition proposal “Triadi” (Kouvolan seurakuntayhtymä, 2016b).

The laws regulating building in Finland (e.g. Land Use and Building Act, MRL 132/1999), and their elaboration in the building code, regional plan documents, city plan and detail plan documents and the municipal guidelines as well as the specific municipal requirements dictate the documents and drawings to be provided for getting a building permit. The types of drawings look similar but more detailed (as seen in Figure 5.) than the drawings of the competition proposal, and they too are defined by convention as well as their position in the process—after the outline of the proposal, but before the more detailed documents meant for construction.

These drawings and documents form a composition of elements whose purpose is to describe the project in a way that ensures its compliance with legal and regulatory requirements. The appearance of most permit documents are similar to ones in competition proposals, but their focus is outside the realm of design—reaching compliance is key. Furthermore, even though providing proof of compliance is the sole purpose of the documents, the set of drawings required, combined with the level of detail that is needed by regulation lead to a series of drawings that give a very comprehensive and thorough account of the whole building.

Construction Drawings: Delegation and Blackboxing

The need to give a comprehensive description of specific features of a project, so that they can be adequately costed and produced requires a variety of construction drawings. The types of drawings that make up the construction drawings of a project are typically based on the permit drawings, elaborating them as necessary by enlarging, cropping, and adding projections, sections and descriptive explanations as needed (as seen in Figure 6.). Their purpose is to describe the chosen feature or part of the building, in a way that makes its production possible.

The construction drawings are prime exemplars of delegation where one distribution of tasks and competencies made up of humans and nonhumans is transformed to another. Human guidance is embedded in the material and notational object of the drawing. The effects of delegation made possible by the drawing are several. In addition to the displacement of guidance in time—by embodying it as a durable object; and place—by the ability of the object to be multiplied and moved. The drawing

also brings together in coordinated form the guidance of several actors—like the contributions of other designers—and allows for exactitude and detail.

The requirement for delegation is that the drawing has to correspond with the guidance it is delegating. Instead of a master craftsman pointing out the location of the cut and miming the arc of movement of the tool, the drawing needs to express this as a faithful translation. In other words, the drawing must carry this translation of guidance and it has to be received by an actor that can decipher it and channel it into action.

No specific phase of the described project provides examples of black boxes as a technological effect of mediation, but blackboxing can be illustrated in the case of the construction drawings by reflecting on the need of widely shared conventions. When we deal with drawings as technological mediators, it is not so much material and mechanical black boxes we are dealing with, but especially conventions of presentation, taken for granted.

The agreed on notations, ensuring that the delegated human contribution is translated in non-human terms and that it results in appropriate action, form a matrix that describes what can be said and how. This matrix is formed in part by material contingencies, paper sizes, presentations scales, techniques of drawing, the limitations of presenting things on a flat surface and considerations of the receptive capabilities of the human eye. And in part it is formed by the principles and conventions of ways of notation—the language of technical drawing and pictorial representation.

Conclusion and Discussion: Reimagining

With this reimagining of the architectural drawing proposed here, we have constructed for ourselves tools for drawing an account of the processes of the production of the built environment and the role(s) architectural drawings play in it. This account contains the distributions and redistributions of competences between human and non-human actors, the resulting composition of all actors on an even footing, the delegations of actions between actors, the interference they effect on each others goals, and the black boxes that speed up or stand in the way of action. We have produced a description of conceptual tools for making the non-human

actors in these processes more visible and audible, even though “it is considerably easier to interview architects, contractors and users than it is to make floor plans, facades and furnishings speak for themselves” (Fallan, 2008, p. 93).

Our illustration highlighted a number of examples where this kind of account provided important insights that allow for transformative reimagining of architectural drawings and the networks they partake in.

In the case of competition proposal documents and the effect of interference, we saw that the types of documents that were required made operations like costing easy, enabled the drawing up of a detail plan, and prepared the project for the permit process. At the same time, the types of drawings that had to be used, interfered with the initial wishes and goals stated at the start of a project. Ironing out aspirations that couldn't be expressed in terms of e.g. site plan, plan, section, or projection drawings. This is self-evident from the viewpoint of the conventions of building processes, but could there be also alternatives, where documents would be imagined from the viewpoint of the initial aims? This is especially relevant, when considering the use and potential of different types of competitions and the possibilities for developing alternatives to the status quo.

In the case of permit drawings and the effect of composition, we saw how the goal to be reached by the composition of human and non-human actors had everything to do with compliance and very little to do with design, while reaching compliance was achieved through drawings providing an exhaustingly thorough description of the design. Here the reading allows us to question the suitability of the drawings as means for reaching the stated end, as drawings in ever-increasing detail can be seen here as unnecessarily cumbersome. This question becomes especially pressing as requirements for permit processes are being updated with new requirements—inevitably meaning more documents and detail—being added. Through the concept of composition, we can ask, are there alternative ways of composing the description of a design, so that the goal of compliance is still reached?

In the case of construction drawings and the effect of delegation, we became conscious of the matrix of expression that the material boundaries of our media present us, as well as of the constructed limits of conventions—designed and honed for efficient

communication, but at the same time begging the question: Is the architectural language of delegated guidance we have sufficient for expressing all that is relevant in building today?

Using the Description of the Architectural Drawing as a Technological Mediator as a set of Tools

Achieving effective change in the processes of building can be described in light of this conclusion as a two-fold operation: 1. identifying the settings of humans and non-humans that partake in a process—how are their competencies distributed and what kind of compositions do they form to reach their ends? How have skills and actions been delegated? 2. What kinds of roles do the non-humans play—how do architectural drawings amongst them interfere and effect the outcomes of these processes as technological mediators—and are there invisible blackboxed actors that need opening up?

As an accurate way of describing the process of the production of the built environment, an account of the distributed competencies in a process provides us a systemic view of the whole, that makes meaningful intervention possible; and by describing architectural drawings as technological mediators, we can consider their potential for change as actors partaking in this whole. The architectural drawing is a material manifestation of numerous other actors and forces, and as it has a traceable genealogy, it can also be reimagined and conceived of differently.

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