Concept
‘Probably the biggest mistake is to make assumptions, in this case to assume that we never think about function or budget, that we just sit around crumpling paper and we let the computer do the rest.’

Seeing the building through models

Before there is the building there is the model. For most clients, imagining a building before it is designed, let alone built, is a difficult task. Imagine, for a moment, that you have been asked to do exactly this. You have to consider how much money you will spend and where the building might be situated. You need to decide what functions it must enable, what facilities it needs to provide, how many people it will have to accommodate (now and in the future), as well as how many visitors it might have. Then, you have to contemplate how its occupants will move around, communicate and work with each other. Where should the stairs be located and how many lifts might the building need? Should it be open plan, closed offices or a combination of both? Is there a need for cafes, lounges or social areas for people to meet? Does the proposed site have views that should be capitalised upon? Should the building have windows that open or will it rely on air-conditioning? How will the building appear from the street: will it be welcoming or austere, impressive or modest? Should it fit within its built context, politely? Will it look the same as the neighbouring buildings irrespective of epoch, function or content? Should it proclaim its own identity?

Now try to imagine how it might look. By this point, most of us, exhausted by this initial flow of questions and considerations, will picture a building we already know; most probably one that we like and then we will align our expectations to this building. To do so is not unusual. To make sense of the world we live in we necessarily relate what we know to what we are asked to imagine. Organisational social psychologist, Karl Weick, calls this process sensemaking. We relate new data or cues to recollections of similarity with things already processed and understood. So, when we make sense of new things we often do so through remembrances of things past. Doing so is inherently conservative, of course: we envisage the new through the old.

Architects that have made a mark on the world do so because they are capable of a different mode of sensemaking: they have to interpret possibilities anew every time they begin a project. Frank Gehry, when faced with the design task, has observed that clients, asked to describe their ideal office, will often describe the office they already have. For the architect the task is altogether different: there are no second acts or repeat performances in great architecture.
Following pages: Each project is assigned a team in the Gehry Partners studio, Los Angeles. This photo, taken in November 2010, shows the architectural team surrounded by models of the design concepts for the UTS building. The intensity and visual stimulation of working like this, surrounded by models that are both finished and in-progress, affords the designers complete immersion in the project at hand.

How, then, are we to shift from the known and the familiar, what we know and know we like, to something beyond what we can imagine? Doing this is the task faced by the innovative architect. Uniquely innovative design entails more than just collaboration with clients, stakeholders and broader constituencies – it involves coaching, learning, explaining and expanding possibilities, deepening imagination, broadening perspectives. Without such involvement neither design nor construction will be realised as envisaged by the architect.

Why design with models?

Sketches and models make envisioning possible. Since at least the 15th century architects have created scale models or prototypes of future phenomenon and the case of UTS’ new Business School is no exception. Within the first six months of working on the UTS Business School Gehry Partners had made around 40 physical models of the project. At the two-year mark, that figure was closer to 140 models and more were still being produced. Towards the end of the project in 2014 around 200 models had been built. Such abundance reveals the physical artefact of the model as central rather than incidental in Gehry Partners’ design process. Models are omnipresent in the Gehry Partners Los Angeles studio. They occupy more than a third of the floor space and every flat surface available, whether floors, shelves, tables, desks, or chairs.

In understanding the centrality of models in Frank Gehry’s practice, models can be seen to do three things – they enable designing, organising and translating: designing (as aides to design and visual thinking), organising (as boundary objects, project management tools, and communication and co-ordination devices), and translating (through processes of unsettling, resetting, managing, enrolling and transforming client understandings). Models are the means by which this innovative architect achieves his unique design outcomes and secures client approval. Ross Milbourne, UTS Vice-Chancellor explains: ‘To me, the models have been a way that I’ve been able to understand the concepts in ways that I’ve not been able to understand concepts for many other designs of buildings in the past.’ Models, then, are significant and evolving objects in the strategic management of both the Gehry architectural practice and its client engagement.

Models fulfil an important function in designing. Designing is a messy, exploratory and uncertain process. After all, when you design you are creating something that, by definition, has
either never been done before or you are seeking to improve on something that already exists. For people who are not architects or designers, a digital animation shown at the start of a lifestyle show about housing or a physical model prepared for an architectural competition, is generally seen as a model that offers a literal representation of how the final building will look. Sophisticated computer graphics can mean that these images look ‘finished’. Virtual models produced using software programs are increasingly displacing the physical models that once dominated architectural practice. These computer renderings are made seductively ’real’ through incorporating live photography and video of people, plants, lighting effects and furniture into smooth, blended and animated simulations of what the building and its interiors will look like. However, whether pixels or paper, polystyrene or plastic, these are not buildings nor are these the materials that buildings are fashioned from. While Frank Gehry uses virtual technologies as significant elements in his repertoire for designing and costing buildings, the turn to the virtual does not mean the eclipse of the material, however: on the contrary, physical models remain central to Gehry’s practice. As Gehry partner Craig Webb observes at the Gehry studio, Los Angeles, in February 2012:

Well, it’s the only way that Frank works ... What I do know, is that in creating the kinds of sculptural shapes that we make, a lot of people work only in 3D computer modelling and what I’ve learned, the hard way, is that you cannot really visualise three-dimensional shapes when you are looking at a 2D representation of a computer screen.

The Gehry design practice is constituted around and through models, model making, and model presenting. Ideas are materialised and made tangible to others through the production of objects such as drawings and physical models. Visual representation in object form is crucial to the way all architects interact and develop knowledge. Yet, the Gehry Partners prolific production of physical models throughout the design process is acknowledged as atypical within international architectural circles. For Gehry Partners the number of drawings and models made reflects the importance of the interactions that they produce with others. Being adept at model making also enables the architects to think concretely. The emergent character of the drawing or model, becoming rather than being something fixed, characterises the nature of designing itself – designing is always evolving, always unfolding, and always emerging. Conceptual objects, then, such as models both constitute and communicate

1. The term ‘boundary object’ was first introduced into the academic literature of Science Technology Studies by sociologist Susan Leigh Star and her colleague James R. Griesemer in their 1989 paper titled ‘Institutional Ecology, Translations’ and Boundary Objects: Amateurs and Professionals in Berkeley’s Museum of Vertebrate Zoology, 1907–39’. The concept of objects such as documents, maps, models, drawings, reports and plans, to list a few examples, that enable cooperation and collaboration between individuals and groups of individuals has become widely adopted in other academic fields such as organisational studies.
Below: In the Gehry studio model making begins with wooden block models derived from the actual dimensions of the proposed building envelope. These models (scale 1:200) are produced swiftly – enabling fast understandings of the building volumes and its possible configurations for the design team. Opposite: Gehry Partners project architect Brad Winkeljoh with Desley Luscombe, Dean of Design, Architecture & Building ‘reading’ a 1:100 model of the final design. The university commissioned this model with funds raised from AMP Capital in 2014. It is now located in the lobby of the finished building.

In the Gehry Partners studio, each designer must be able to work across three media – the physical model, 2D drawings and 3D computer models. Architects, newly appointed to the firm, make physical models for their first 12 to 24 months in a process one senior partner describes as ‘boot camp’. From the start of a project, design concepts are created, modified and contextualised in physical models, 2D drawings and 3D computer models. These always track in parallel. New technologies and increasing sophistication in computer software programs facilitate new ways of working for the Gehry team but have not displaced their established and preferred ways of thinking and acting. In responding to changing technologies the practises of this architectural team are reshaped not redesigned, embellishing existing ways of doing things. As Frank Gehry says in an interview with Greg Lynn:³

For me, the problem with designing buildings on the computer is that some of the work that comes out of this retains the fingerprint of the software system [...] The personal intervention, the brain that transforms it into art, is needed to get beyond the recognizable language of the computer program.

The model-making process in the studio commences with wooden block models derived from accurate dimensions and information about the parameters of the proposed building processed through a computer. Analysis of these block models enables the designers to play with the volumes of the building – stacking, cutting and reconfiguring the blocks in early iterations that look, for example, at ‘what’s the most condensed form the building can take and then what form it takes to give it more height’ according to Gehry partner Craig Webb. These models are made quickly by any member of the project team with what is to hand, either in the model workshop or on the studio floor. The models at this point act as ‘diagrams’ for the designers that can be costed and shown to the client as the pragmatic encapsulation of what the building costs as a construction ‘without architecture’. In this way, the design team establish a baseline cost model and, as Webb explains, ‘everything that progresses after that gets compared back with that’. It is only after this stage that the architectural expression of the building is developed.
Models also fulfil a second function in the Gehry practice, that of *organising*. They are the things around which other things happen. The models become important in the communications between architects and their clients, and between architects, clients and contractors. They facilitate and sustain relationships through focusing discussions on the architect’s ideas and the physical forms such ideas may take. Relations between the material building envisaged and the social life that it will contain, the thought embedded in the design and the actions that the design will enable, are expectations and values negotiated in the model process. ‘It was the catalyst for us to really discuss what we wanted the building to do’, explains Patrick Woods, UTS Deputy Vice-Chancellor Resources. At one stage, Professor Shirley Alexander, Deputy Vice-Chancellor questioned the angled walls in a proposed classroom, worried that they would be irritating for students to look at when used for audio-visual screens. When the Gehry architectural team next returned to UTS, they brought with them a model made specifically to address this concern. Though Alexander remained unconvinced, she was ‘very chuffed that Frank Gehry had built – oh I don’t – I’m sure he didn’t personally do it, but that they actually went to the trouble to build a model to assuage my concern.’

In these ways models form a common boundary between different worlds – the world of architectural practice and the client’s world – bridging them. Models also enable different project participants, such as the principal design architect, the architectural team, associated architects, clients, project managers, marketers, building contractors, suppliers, media and stakeholders, to collaborate at an early stage. The models act both as anchors for and bridges to the varying needs, values, and perspectives that participants bring to cooperative work. ‘What I think is fundamental to the model’, explains Desley Luscombe, Dean of Design, Architecture & Building, ‘is that their general representation must entail abstraction. Because of this, models need explanation and engagement to enable, in the mind of all parties who examine its abstraction, a collective understanding of how it can become architecture. Like all abstractions, viewers must read into the model a specific interpretation of what they are seeing.’ On the UTS project different groups in the project team tack between their readings of the models, as they each understand them, enabling cooperation if not always agreement. Models in this sense are always part of a larger process, negotiated with the various stakeholders and dynamic in that the relationships,
A 1:100 study model from August 2010 starts to materialise the flowing façade, mirrored windows and enormous shards of glass that are retained, albeit in different form, in the final building.

understandings and experiences they generate are always in flux. In the early stages, the design process typically is a highly dynamic and situated activity: moving from considerations of context, topography, volume and massing to architectural form and materiality. On his first visit to UTS, when asked what he thought of the proposed site, Frank Gehry replied, ‘I like the problem’. In saying so, Gehry meant that difficult sites challenge the architect to design more interesting buildings in response.

The early physical models that the Gehry architects make, based on Frank’s initial sketches, are always exploratory. Gehry, in an interview with journalist Jana Wendt in June 2010, notes many clients become ‘fastened’ on that first sketch, when at that point in the design process the sketch is simply a response and not thought out. He observes that ‘[A] lot of buildings get built based on that early misunderstanding of [the] project. They say, “Well, I liked it better then.” So we take them through it, and try to keep them from fixing.’ In keeping the process liquid, despite the tensions of the architectural contract, the desires of the client impatient for an outcome and the potential that the brief might be re-evaluated, Gehry maintains the flexibility of design. After all, an object not fixed remains in flux: it is a thing knowingly not finished. The progressive iteration of the models creates the space necessary for reflection by slowing down the design process for both the design team and their clients. As the material models are iterated they require the rebuilding even of those elements considered finished. Each model the studio makes is made entirely anew, not cannibalised from predecessors using elements already fabricated.

As ideas for the architectural expression of the building begin to materialise, the models become more readily understood as a building form. It is at this point, however, that a paradox may arise: the ‘affordable’ design. In meeting the client’s brief, the constraints of the budget – what can be achieved – relative to what the client wants, can become evident. It is at this stage of the design process that a model scheme for the building without architectural flair, without the Frank O Gehry signature, but with the requisite volumes and floor allowances was presented to the UTS clients. It was noted by Gehry Partners that this scheme fully met the clients’ brief in terms of functional specification; however, its delivery would absorb most of the client’s budget. The portion of the budget that remained would dictate a more limited and conventional repertoire of materials, technologies and construction techniques than a Gehry building characteristically requires.
Affordable models are not a point arrived at as some designer sleight-of-hand, to convince a client to increase the budget, rather they are a stepping stone along the path the client is taking. Gehry Partners devote considerable time and resources to fully document the ‘affordable’ scheme. In the UTS project this included detailed floor plans for each level of the building, interior and exterior models, cost calculations and photography. Two schemes, Schemes #20 and #21, were developed in parallel until April 2010 at which point the university opted for the more ambitious project. In the words of Bill Paterson, Faculty Manager at the time:

The lower building [Scheme #20] would potentially not leverage the benefits of the Gehry brand in the way in which the higher building might, without in any way compromising the required functionality of the building. I say that advisedly because I think there are a lot of small-scale buildings, which Frank Gehry has designed, which are absolutely terrific and quite beautiful and small. So it wouldn’t have been that the building would have been uninteresting, but I think that the higher building created a connection and sense of relationship to the city context ... the university made a strategic decision in relation to that.

The affordable models tell clients what can be built in terms of design and cost constraints, yet they rarely fulfil clients’ ambitions for a Gehry building. Such clients have become committed to desiring what the architect does ‘best’, something that they know through the many famous precursors of a Gehry building well represented in the architectural press. However, no re-using of the same ideas occurs in Gehry Partners’ professional life: new clients will never get another Guggenheim Museum Bilbao though they will undoubtedly recognise the same architectural language of ‘contradiction and clash ... full of surprises and overflows, overlappings and vibrations’.4

Models fulfil a third function, that of translating. This is not the literary meaning of translating as to render in another language5 but the sociological meaning of translating, theorised by sociologists Bruno Latour, Michel Callon and John Law as ‘transforming’ and ‘enrolling’ the client into the architect’s way of seeing. In this sense, models do not speak for themselves but need to be staged, interpreted, understood and framed. Seen in this way, models are always in want of translation. For the architects, the different perspectives that could possibly

---

constitute their meaning at that moment, in that context, and for that audience, need to be managed. Managing presentations of the models is made more difficult when it is done with large groups, such as the media or groups of stakeholders. For a model to have meaning for an audience a series of negotiations, calculations, persuasions and other actions have to occur. The models are devices that assist the Gehry practice frame their authoritative view of what the building means for them. Through their particular context, experience and personality the ways in which clients know the project is always different. Sometimes unwittingly, sometimes purposefully, clients ‘re-design the design’.

However, the interests of the various participants are only temporarily stabilised for, according to sociologist Michel Callon, translation ‘is a process, never a completed accomplishment’. For the architect the many interests of the various stakeholders need to be attended to, and attracted to the architect’s way of seeing, in order to be transformed into a shared vision of what the building might be.

**A shared vision**

When commitment to a vision experienced as shared is secured the models have achieved the strategic objectives of the Gehry team. Through these specific and highly signified architectural ways of seeing, the client’s way of thinking about the building has changed. Having seen many different models, the client is engaged in a process of becoming: becoming alert to the realisation that the models are a process along the way to a final (yet unseen) resolution and not a literal representation of the finished building. According to Deputy Vice-Chancellor Resources Patrick Woods:

When Frank first put his models together and started the iterative process I think it was both a beneficial and yet scary process for the university, because we’re used to being presented with a vision of, or an end point vision – this is what the building will look like. The Gehry modelling process actually both allowed us, as a client, and forced us, as a client, to participate in the development of the design.

For the client, referring to the architect’s other works in progress (in addition to those already built and, preferably, already famous) and relating these to the models that emerge during a design commission, is also a powerful and succinct means of engagement. To the architect this practice expresses
how clients ‘see’ projects, what ‘works’ for them, as well as what they don’t want. As Ross Milbourne, Vice-Chancellor, explained:

On my first visit, they took us around and showed us all the other projects they were doing and showed [us] all the models. I thought at the time that they were just being very nice ... seeing the way they work and things – but I think, in hindsight, what they were looking for was my reaction to quite different architectural styles and ways of doing things. So, I think when I said, ‘Gee, I like that,’ just as a comment on the way around, they stored that away in their own brains trust as things I liked and didn’t like.

It is evident that clients commit to architectural projects in various ways: emotionally, institutionally, contractually, and contingently. Innovative design practices, such as Frank Gehry’s, require a further commitment that is implicit and therefore not easy to acknowledge. The practice’s previous accomplishments stalk the imaginations of today’s clients while the architect must respond to the specific considerations of this site, this brief, this budget, and this client system. Reconciling the specific contingencies of site, brief, budget and client system in a way that carries the Gehry signature but does not replicate previous accomplishments is the challenge. In making ideas material in model form, models allow the negotiation of the architect’s ideas. In this way, models stimulate insight into concepts and ideas as well as to position these ideas within a continuum – from the pragmatic meeting of the client’s needs to positioning much more innovative design approaches. The power of innovation lies not in delivering what a client wants but in delivering what they can’t even imagine. The explicit commitment that the client makes in commissioning Frank Gehry is to empower the architect to do just this. As Gehry himself observes: ‘They can’t tell me what it’s supposed to look like, and I can’t tell them what it’s going to look like.’

Narratives and conversations are needed to continually connect the worlds of Gehry Partners and Gehry Technologies to the larger social structures of the client system, in this case, the University. Often these connections take a great deal on trust. As Gehry says, in an early stage of the design of the UTS Business School, ‘We’re getting inklings now, and I think they’re starting to – as of today starting to see the trajectory, let’s call it, of the thinking. I think it’ll build a

---

confidence in them that we’re going somewhere, and that it’s not going to look like that model. Uncertainty about the final design creates the space needed for the designer’s reflection as well as serving to unsettle client expectations, making clients more open to possible outcomes whatever these may be negotiated as being. Models, then, keep the design fluid and clients curious. In the process of their use and the negotiation of design decisions concomitant with them, the range of understandings is slowly narrowed down, compelling the client to participate in the development of the design on the architect’s terms.

On large and complex projects trust is especially important. On such projects, clients are rarely singular entities but comprise a complex client system of various disciplinary affordances with which the Gehry architectural practice must engage. UTS, as a large institutional client, is exactly such a system in which roles, responsibilities, and architect/client interactions were allocated across many individuals and not vested in any one person. As one UTS client expresses this: ‘In the end we did trust him but we trusted him because he was a starchitect as it were, to use that term. We’d seen his previous products, so we assumed his – this product – would reflect in some way, shape, or form his previous thinking, which it doesn’t. It’s a very different building from anything I’ve ever seen him do...’. In architectural projects, such as this, conducted over many years and with a large and ever-changing cast the relationships that Gehry builds with the executive clients are critical to both the nature of the work and the nature of the man. Such relationships are created, developed and sustained in ways that are often out of reach for less renowned architectural entities. ‘Much more interaction and much more dialogue,’ Vice-Chancellor Ross Milbourne acknowledged. He continued, ‘the Gehry team has been fantastic in working with us and talking backwards and forwards. Anything we put up as a suggestion, they’d go away and work on and see how it was going to be done. It’s been a perfect engagement from my perspective.’ He concludes: ‘We’ve thrown some difficulties and issues at them and they’ve always come back with a solution or have been able to convince us why we should do something the way that they’d originally thought. ... I don’t think I could have wished anything better.’

In conclusion, models do much more than just represent the potential building. In many ways, their representational role is less significant than their role in facilitating strategic
and interesting conversations within the architects’ practice, between the practice and the client representatives, and within the client’s community of practice, as well as with a wide array of interested observers. Hence, it is important that they do not literally represent some thing, for, if they did, their role as aides for the imagination, as objects for strategic conversations, as devices that can generate energy, creativity and innovation, would be lost. Models are engines of and for the imagination, dynamic not static devices for representing something that corresponds to them or coherent accounts of some future perfect state.