# 9 Design Representation: Private Process, Public Image

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Dedicated to the memory of Tom Heath, who was an architect, scholar, educator, and wonderful person.

## Introduction

In a lovely little book titled *What, if Anything, is an Architect?* the late Tom Heath (1991) offers no definition, and no direct reply to the question evoked by the title. Rather, the book is a collection of short articles about issues that pertain to architecture and to the architect's activities and concerns. We would like to adopt a similar strategy. At the outset we should be asking: what (if anything) is design representation? Instead, we shall briefly outline some of the underlying dimensions that we think are of importance when considering design representation, architectural or otherwise.

Designers represent – and design representations are made – before, during, and after the process of designing any entity, regardless of whether the designed entity is being constructed, manufactured, or assembled as a "real" product. In fact, the ultimate design goal is to arrive at a satisfying representation of the designed entity: bringing the "real" entity into being is a task that usually falls into realms other than design, and actors other than designers (e.g., builders and manufacturers) are responsible for it. We may argue that to design is to represent, and in no case is there design without representation.

Representations are not all of a kind: on the contrary, representations differ vastly in purpose, in modality, in the media they use, and in their level of abstraction (Grignon 2000). Representations may be internal – in the

mind – or external, i.e., material and physically perceivable. The former are of great significance in the mental processes of reasoning about one's design, but it is the latter that we shall address in this chapter. Representations are the basis for communication among team members in a collaborative design effort (e.g., Benaïssa and Pousin 1999), whereas in the case of an individual designer, they facilitate the dialogue of the designer with him- or herself and with the design materials (Schön and Wiggins 1992). Some representations are elaborate, precise, and detailed descriptions of the designed entity, whereas others are "quickies," rough outlines of initial ideas. Representations may be concrete or abstract, true to scale or lacking scale altogether. They may be pictorial, written or otherwise expressed in a language of symbols. Some are three-dimensional, like scale models of buildings, but most are two-dimensional and consist of marks on paper (or computer monitor). They may adhere to conventions, such as the rules of perspective, for example, or they may be free interpretations of the designed entity.

Representations vary in consistency: they may give a full and detailed account of all parts and all aspects of the designed entity; at other times, they may be partial, pertaining to selected elements only, or displaying different components with varying amount of detail and attention (Herbert 1988). Some representations are vague and depict a general concept only, and others are not concerned with the physical properties of the designed entity but with operational properties that are best expressed by diagrams.

It is of great interest to study design representations from the standpoint of the designer or designers: of the almost endless possibilities, what kinds of representation do they choose to make at various phases of a design process? Why are some types of representation and modes of representing privileged? How typical are certain representational characteristics to particular designers, or to kinds of design tasks, or to a domain of design? How situated are such representational modes in historical and cultural contexts? And, equally important, we should also shift our attention to the receiving end: what impact do design representations have on those for whom they are intended? Are representations influential and, if so, in what manner?

In this chapter we propose a framework for the study of design representation along two perpendicular axes: the axis of the image, with its private and public poles, and the axis of epistemological dimensions, i.e., the intellectual realms in which a discussion of design representation is relevant and timely. These dimensions are *cognition*, *history and culture*, and *technology and media*. We shall discuss the questions regarding private and public images within each of these three dimensions.

## Cognition

Design problems are ill-structured and it is therefore necessary to conduct a search en route to a design solution since there are no problem-solving algorithms as in the case of well-structured problems. A design search is primarily aimed at eliciting potent preliminary ideas, a design concept that can be developed and refined into a concrete solution proposal. In the process of generating, developing, and assessing ideas, one *reasons* about them: the designer or design team inspects ideas and images, sources of inspiration, partial solutions, and so on to ensure their relevancy, their congruence with