Chapter 8

SYNTHESIZING A QUESTION-CENTRIC DESIGN THINKING MODEL

A question-centric design thinking model, which describes a structure for design thinking, can be synthesized from the findings of this research. This entails reconsidering the empirical findings within the context of the theoretical frameworks on the nature of questions asked while designing and design performance. My synthesis method consists of the following steps:

1. Assigning meaning to the empirical findings by developing three paradigms that treat question asking in design as a:
   - Process
   - Creative negotiation act
   - Mechanism for managing divergent-convergent thinking modes
2. Using the third paradigm to outline a process for arriving at design decisions by asking questions.
3. Considering the implications of the verified hypotheses in light of these three paradigms.
4. Operationalizing the key elements of the insights gained in the preceding steps by mapping them onto the design process.

In the following three sections, I present the three paradigms outlined in the first step. In the fourth section, I outline the implications of the verified hypotheses. In the fifth section, I present the outcome of my synthesis, a question-centric design thinking model. In the final section, I consider five potential applications of the model.
8.1 Question Asking as a Process

Two frameworks were developed in Chapters 3 and 4. The first framework is a comprehensive taxonomy of questions asked while designing. It characterizes and differentiates questions according to their conceptual meaning (Table 3-1). The resulting taxonomy is hierarchical as the lower level question categories are associated with less sophisticated cognitive mechanisms than the higher level categories. Of particular interest were two classes of questions encompassing the higher level categories: Deep Reasoning Questions (DRQs), which reflect convergent thinking, and Generative Design Questions (GDQs), which reflect divergent thinking.

The second framework conceptualizes design performance in terms of the relationships between four phenomena: design performance, design cognition, design process, and question asking (Figure 4-6). The relationships are hierarchical as the lower level phenomena are thought to be a subset of the descriptors of the higher level phenomena. Design cognition and design process are considered to be descriptors of the same level as they are strongly dependent on each other in the sense that they feed into each other in a cyclic fashion.

The hierarchical structure of the framework on the nature of questions suggests the possibility and relevance of treating question asking as a process. However, since it only articulates the conceptual differences between questions, its principles alone are not sufficient in forming a process-centric view of inquiry in design. Although the hierarchy suggests temporal distinctions, it does not address them explicitly. However, the timing of questions, an element of inquiry investigated in the experiments, provides an initial understanding for the missing temporal dimension. Moreover, considering the empirical findings in conjunction with the principles of the hierarchy strengthens the meaning and validity of treating question asking as a process; the principles of the hierarchy can relate a process-centric view of inquiry to the design processes of teams, and ultimately, to design performance.

The rationale presented in the preceding paragraphs is an advanced formalization of what Baya and I have independently observed in the question asking behavior of designers. Baya wrote: “The questioning behavior is not random. New questions are being asked after reflecting on information received in answer to a question” [Baya 1996J. The findings of the research presented in this book not only reiterate Baya’s observation, but also build on it by formalizing several key aspects of the inquiry process in design.