MOVING DESIGN FROM METAPHOR TO MANAGEMENT PRACTICE

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Abstract: Despite the centrality of "design" to the field of organizational science, we argue that its use has remained at the level of metaphor rather than practice. Donald Schon's concept of "reflection in action" addresses this gap by describing how managers can practice *designing* by generating problem frames as hypotheses, and then testing and refining those hypotheses in the situation. Much of management theory has focused on stable and predictable situations where problem framing is less important. As practitioners and scholars alike increasingly embrace the complexity and ambiguity of the global business environment, Schon's ideas are starting to take hold. In this article, we explore Schon's concept of the "reflective practitioner" and show how it can move beyond theory to implementation.

Keywords: Design; design process; problem framing; hypothesis generation

For those who study organization design, one of the most influential works has been Donald Schon's (1982) book, *The Reflective Practitioner: How Professionals Think in Action*. In it, Schon put flesh on the bones of Simon's (1969) assertion about the centrality of design to the practice of management by providing detailed descriptions of the design process for professional work across an array of fields. While business managers are the focus of an entire chapter, Schon's analysis of managerial practice has received less attention than his chapter on architecture, featuring the arresting character of Quist, a master architect. It is Schon's rich description of Quist's "reflection in action" that contributed to establishing design as one of the powerful metaphors in the field of organizational science:

> *Quist spins out a web of moves, subjecting each cluster of moves to multiple evaluations drawn from his repertoire of design domains. As he does so, he shifts from embracing freedom of choice to acceptance of implications, from involvement in local units to a distanced consideration of the resulting whole, and from a stance of tentative exploration to one of commitment. He discovers in the situation's back-talk a whole new idea which generates a system of implications for further moves. His global experiment is also a reflective conversation with the situation. (Schon, 1982: 102-103)*

But "design" in use, both in research and in practice, has remained largely at the level of metaphor, meaning "a word or phrase literally denoting one kind of object or idea used in place of another to suggest a likeness or analogy between them" (Merriam-Webster Dictionary, 2012). In other words, we have not taken to heart the actual *practice* of designing and what that looks like as practiced by Quist, a true designer. Instead, we have spoken figuratively of the need for design as a kind of grand plan, not taking the notion of *designing* literally. To do so would be to treat design as a verb instead of a noun, and to teach design methods to our students and advocate their use by practitioners. Schon's contribution is to share with us the specifics of design as a practice, by highlighting Quist's process of decision making as a "reflective conversation with a situation" in which the complexity of the situation necessitates an experimental approach. Each choice Quist makes results in both intended and unintended consequences that he attends to carefully. In this view of professional practice, design becomes a "shaping process" in which the situation "talks back" continually and

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"each move is a local experiment which contributes to the global experiment of reframing the problem."

This view of the decision-making process is of special significance in today's increasingly complex and ambiguous business environment, and it offers managers a powerful means of enhancing their individual effectiveness. It also suggests organizational designs better suited to the challenges of solving the "wicked problems" (Churchman, 1967) that characterize strategy making today.

ELEMENTS OF THE REFLECTIVE PRACTITIONER IN ACTION

Schon's designer begins by imposing a frame on a situation and then uses that frame to explore a variety of hypothetical "what if" statements before settling on a particularly promising one for further inquiry. The hypothesis-generation process is followed by an evaluative conversation in which the designer *acts* (in the virtual environment provided by the design process) and then attends to the feedback from the situation to iterate towards an improved solution. Throughout the process, the designer calls up his or her past experiences ("repertoire") and uses these to inform but not to constrain choices, moving between intense immersion with the nuances of the situation and a more distanced appraisal of the whole.

At an abstract level, it is easy to extend the metaphor of architectural design Schon describes to the design of organizations. Organizations, after all, are just particular kinds of spaces. Rather than working with bricks and mortar, organizational leaders create spaces out of different kinds of material: structures, cultures, systems, and processes. Nonetheless, these organizational spaces are designed with a purpose in mind, and they succeed (or fail) to the extent that they evoke the desired behaviors from their members necessary to achieve the organization's purpose. Schon teaches us that the process behind the creation of space is fundamentally *hypothesis-driven* when practiced by the masters.

This core lesson, however, has largely failed to take hold in management practice. For most business managers and students, the concept of hypothesis-driven decision making remains a foreign one, scarcely attended to in most business curricula or given attention in management practice. The traditional decision-making processes that are taught involve a linear method of thinking in which the problem is defined (and that definition is accepted as "true"), a comprehensive range of alternative solutions is generated and evaluated, and the optimal one is selected. While this decision process can be efficient, it is less useful in complex and ambiguous situations, where problem definition is an open and critical question.

In contrast, a hypothesis-driven approach is iterative in nature, skeptical as to the definition of the problem itself, opportunistic in its generation of solutions, and almost obsessed with optionality and experimentation, rather than a single-solution approach borne of analysis. The stark contrast between the linear and hypothesis-driven approaches, while keeping Schon's work on the reading list of doctoral students, has not accorded it much attention on the reading lists of managers, who tend to be more comfortable with efficiency than experimentation.

This situation may be changing: Schon's *ideas*, if not his words, are very much at the center of management conversation today. His ideas are especially evident in current popular management tomes that call attention to "little bets" (Sims, 2011), "lean start-ups" (Ries, 2011) and "learning launches" (Liedtka, Rosen, & Wiltbank, 2009), to note just a few of the terms that have emerged to encourage experimentation in organizations. Schon's concept of repertoire has also recently received enthusiastic attention in the popular press, as in Malcolm Gladwell's *Blink* (2005), and in the business press in books such as *Strategic Intuition* (Duggan, 2009).

It does not require great foresight to see why design-oriented, hypothesis-driven behaviors are likely to lead to more effective and efficient organizational functioning in environments of continuous ambiguity and uncertainty, or why answering the wrong question, or answering the right question poorly, is increasingly costly in such environments. Hypothesis-driven thinking allows the accommodation of both the left brain processes traditionally associated with business with the right brain processes suddenly popular in the wake of the success of innovative firms like Apple and IDEO. In such firms, hypothesis generation asks the

creative question, "What if?" and hypothesis testing follows, bringing relevant data to bear on the situation. Taken together, and repeated over time, this sequence allows managers to achieve ever-improving outcomes without forfeiting the ability to explore new ideas. Such an approach allows movement beyond simplistic notions of cause and effect to continuous learning and is central to creating ambidextrous organizations (Tushman & O'Reilly, 1996). Translating Schon's theories and observations from abstract ideas into concrete behaviors represents a significant opportunity for management practitioners. In the next sections, we discuss what that translation would look like.

BRIDGING THE GAP BETWEEN THEORY AND PRACTICE

Creating effective hypothesis-driven organizational decision making involves paying attention to three distinct elements highlighted by Schon: framing, assumption testing, and repertoire.

Framing

Problem framing is a well-recognized aspect of decision making – in theory. Before managers can solve problems or take advantage of opportunities that may arise in their businesses, it is evident that they must frame those problems or opportunities. Schon's work contributes by directing our attention to the importance of the *conscious* imposition of a frame on a problematic situation. That is, he insists that the frame itself be treated as a hypothesis. We know that leaders often identify and frame problems intuitively without much conscious deliberation. Thus, they do not notice or pay as much attention to framing as they do to other phases of decision making. By engaging this process more carefully, managers can explore improved frames for problem definition and avoid the costs associated with selecting and persisting with a flawed frame.

The "facts" of a situation are always interpreted from a particular point of view. Schon points out that people frame problems based on their *repertoire* of past experiences and knowledge. Some problems are particularly difficult because they can be associated with a variety of factors, and therefore, it can be unclear how one should frame the problem and how one can best act in relation to it. To engage in more deliberate problem framing requires meta cognition – or thinking about thinking. Decision makers must question their own approach to the problem and consider ways to approach it differently that may increase the chances of obtaining a successful solution.

Schon says that decision makers must then attend to how the situation is *reshaped* by imposing that particular frame, by assessing what actions become possible as a result, what disconfirming data arise, and what explanations might account for them. Seeing a situation in a particular way is not enough; the effectiveness of the frame must be discovered in action, preferably in low-cost tests of the assumptions that underlie the solution derived from that frame.

Assumption Testing

To treat a problem definition as a hypothesis entails surfacing and testing the assumptions upon which it is based. Any hypothesis is only as good as its underlying assumptions are valid. Raising and testing deeply embedded assumptions about what must be true for any given choice to be a good one is essential to good decision making. It is in the testing of assumptions that, in Schon's words, "the situation talks back, the practitioner listens, and as he appreciates what he hears, he reframes the situation once again, in an iterative not a linear fashion" (1982:132). In the assumption-testing process, discrepant cues and disconfirming data can reveal the inadequacy of a particular frame and its attendant solution.

But managers find this approach challenging in practice. Almost 50 years after Simon's (1969) assertion that design is central to management practice, hypothesis generation and testing is rarely at the core of *any* training in management. Accordingly, most managers are not trained to be hypothesis-driven in their decision-making approach. Though they may be data-driven, it is generally historical data that managers already have on hand that they use

in their decision making. Starting with a hypothesis and then figuring out what data you need to test it – and where to find that data – reverses this process. Many times the assumptions themselves are not clearly visible nor are the data needed to address them readily known. Therefore, it has to be solicited from key stakeholders. In order to conduct such tests, Schon points out that managers must have "virtual worlds" to work in:

> *Virtual worlds are contexts for experiment within which practitioners can suspend or control some of the everyday impediments to rigorous reflection-in-action. They are representative worlds of practice in the double sense of "practice." (Schon, 1982: 162)*

Providing the safety of virtual worlds in which organizational members can conduct their experiments and test their framing of a situation, as well as the solutions a particular framing suggests, is an essential task in organizational design according to Schon.

Repertoire

Central to both framing and assumption testing is Schon's notion of repertoire. Repertoire is a set of interpretive lenses that practitioners acquire through experience and learning. The quality (and hence efficacy) of the initial framing and its attendant hypothesis generation is repertoire-dependent: the hypothesis that Quist generates is strongly influenced by his past. To be a master architect is to possess an array of frames that relate to the shape of different problematic situations. As the situation "talks back," Quist interprets what it says through his own stories and experiences to make sense of unfolding reactions as they occur. Quist's extensive repertoire allows him to quickly hypothesize about the "shape of the problem." This recognition allows him to zero in on a hypothetical solution with seemingly uncanny accuracy. What looks like a flash of brilliant insight – or creativity – is in fact his repertoire at work. It is not that Quist is smarter than the young apprentice he supervises. He merely has what she lacks – an extensive set of experiences that he has transformed into learning that is accessible in the face of a new situation.

When decision makers try to make sense of a new situation, they search first for its familiarity to something already present in their repertoire. Indeed, "it is our capacity to see unfamiliar situations as familiar ones and to do in the former as we have done in the latter that enables us to bring our past experience to bear on the unique case," Schon (1982:140) asserts. Thus, helping organizational members develop a broad repertoire is key to grooming them for success in hypothesis generation. Furthermore, Schon argues that it is only in the *doing* that repertoire really develops. Learners must be allowed to make choices and then be encouraged to understand the consequences of such choices in the situation's "back talk." This reaffirms the importance of "virtual worlds", and the challenge of organizational design is to create environments that make the consequences of those choices, and the inevitable mistakes that they embody, as low risk and inexpensive as possible.

IMPLICATIONS FOR PRACTICE

We see five ways that Schon's ideas can be implemented in order to enhance an organization's ability to deal with complex, dynamic environments.

1. **Focus on building repertoire.** Opportunities lie latent, waiting to be discovered, but only some of us see them depending upon our repertoire. Chances are that those who spot opportunities can do so because they have *already* seen them in some form or another, perhaps in a different industry or other environment. The broader an organizational member's repertoire, the more experiences that person has had, the more likely he or she is to see something that others with a narrower repertoire will miss. This is important to keep in mind as organizations design employee development processes and paths. Developing managers in silos makes for narrow repertoires. High-performing organizations have long believed in developing leadership talent through exposure to multiple functions and businesses. This model has a direct impact on employees' ability to be better decision makers in the face of uncertainty as well.

   While obtaining multiple experiences, organization members must be explicitly guided by the concept of repertoire building. Dweck's (2006) research on school

children's development, whether they pursue or avoid new experiences, offers sobering evidence of the extent to which our educational systems discourage learning when they emphasize avoiding mistakes. Higgins (2007) offers a similar perspective about our individual predisposition. Like Dweck, Higgins sees two types of focus in new situations: promotion and prevention. People with a promotion focus ("promoters") are motivated by an idealized end state which leads to a concern with advancement, growth, and accomplishment. Those with a prevention focus ("preventers") are motivated more by avoiding negative outcomes and so are concerned with protection and safety. Promoters, Higgins argues, prefer errors of commission because their inclination is to act, to pursue multiple avenues to reach their goals. Preventers prefer errors of omission, choosing instead not to act in order to minimize the possibility of a negative outcome. These two streams of research suggest that many organizational members arrive at work with a fear of failure that causes them to avoid opportunities that build repertoire, preferring instead errors of omission. When organizations punish mistakes, they add fuel to the fire and encourage unwillingness to experiment and the avoidance of new experiences that broaden repertoire.

A focus on repertoire also necessitates that we give special attention to managers who have "grown up" without the benefits of attention to broadening their experience base. Here, two prescriptions come to mind. First, much research attests to the importance of diverse teams that provide a broader perspective when the repertoires of individual members are limited – the diversity of the cumulative members' experience may compensate for the narrowness of individual repertoires. Second, explicit attention to the influence of industry and organizational mental models on problem framing becomes especially important in decision-making processes.

2. **Focus on doing while analyzing.** In an uncertain environment, the bias clearly should be towards experimentation and action, granting organizational members the autonomy and resources to act without seeking layers of permission. And if risk cannot be avoided, organizations must turn their attention to managing it. Organizational designs must encourage members to start small with contained experiments that minimize the costs of learning. Examples include using partners instead of building new manufacturing facilities and relying on the extension of already developed capabilities versus developing new ones. Part of risk reduction is also about keeping it simple and local – where feedback is quick and unambiguous, and where corporate politics and layers of interpretation do not get in the way of assessing the relationship between cause and effect. This is how learning from experiments is made easier.
3. **Obtain quick and inexpensive feedback from the environment.** "Fail early to succeed sooner" is a phrase heard today in innovative organizations. In fact, an emphasis on speed may be the ultimate Trojan horse of adaptability and innovation – so seemingly innocent on the outside, but subversive to bureaucracy at its core. Decision-making processes in many large organizations are set up almost surely to veto managers' ability to quickly and easily conduct small experiments in the marketplace. Instead, managers find themselves trapped in conference rooms, revising Power Point presentations aimed at "proving" that an idea that does not yet exist will succeed in order to obtain permission to act. This is a fool's errand. Advice to end run the systems and processes set up to control access to funding and other organizational resources sounds subversive indeed. Committing to making speed a top priority accomplishes much the same thing but from beneath a cloak of respectability – for in today's world, who can be against speed?

   On the other hand, while organizations *should* be impatient to act, they must not be so impatient that they proceed to scaling a new idea without first listening to the situation talk back. Often, an organization's idea of an experiment is to pilot a new product and see whether or not it sells. This, however, does not constitute a test that allows for learning about how to improve the hypothesis for further testing. In a world of complexity and ambiguity, we are unlikely to get it right the first time, and so data that allow us to fail quickly and cheaply may be the most useful kind of all.
4. **Create virtual worlds where it is safe to fail.** Organizations need to be designed to conduct experiments aimed at learning rather than testing theoretically finished products

and strategies. To borrow Schrage's (2000) concept of "serious play", treat prototypes "as playgrounds not dress rehearsals." Managers need to test assumptions rather than final solutions. The idea that organizations must take risks to succeed in uncertain environments is an old cliché. With risk comes the possibility of failure, of committing errors. Therefore, organizational culture and process must be accepting of intelligent "mistakes" in service to learning. Levitt (2012) discusses how virtual methods can be used to study, design, and even invent organizations.

5. **Establish infrastructure to support experimentation.** Many of the behaviors Schon advocates are facilitated by appropriate organizational systems and processes. Organizational members develop broad repertoires more easily when rich human resource processes for recruiting, training, and education are in place. Individuals are encouraged to have a growth or "promotion" mindset when the organization's own cultural mindset is not fixed. Feedback arrives quickly when information and accounting systems measure the right outcomes and get this information to the right people promptly and accurately. Minds are prepared to recognize opportunity through thoughtful planning and budgeting practices and exposure to customers. Ideas get to market for rapid testing only when trusting relationships with supply chain partners make that possible.

CONCLUSION

Schon recognized the inherent tension between the design orientation of professionals and the rules of the bureaucracies they are often asked to operate in. That tension – that "organizational predicament" as he called it – demands extraordinary organizational designs:

> *In contrast to the normal bureaucratic emphasis on uniform procedures, objective measures of performance and center/periphery systems of control, a reflective institution must place a high priority on flexible procedures, differentiated responses, qualitative appreciation of complex processes, and decentralized responsibility for judgment and action. (Schon, 1982: 338)*

More than thirty years later, Schon's words still ring true, and we aspire to see increasing use of his "reflection in action" approach by business professionals, to transform design from a metaphorical talking point to a reality in practice.

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