Chapter 8.3
Knowledge Engines for Critical Decision Support

Richard M. Adler
DecisionPath, Inc., USA

ABSTRACT

Current knowledge capture and retention techniques tend to codify "what-is" and "who knows" more effectively than "how-to." Unfortunately, "how-to" knowledge is more directly actionable and indispensable for critical organizational activities such as strategic analysis and decision making. Knowledge management (KM) theorists often despair over "how-to" expertise as a form of tacit knowledge that is difficult to articulate, much less transfer. We argue that tacit strategic performance-based knowledge can often be captured and deployed effectively via frameworks that combine scenario planning methods with "what-if" simulation. The key challenges are twofold: (1) modeling complex situational contexts, including known behavioral dynamics; and (2) enabling knowledge workers to manipulate such models interactively, to safely practice situational analysis and decision making, and learn from virtual rather real mistakes. We illustrate our approach with example knowledge-based decision support solutions and provide pointers to related literature.

DOI: 10.4018/978-1-60960-195-9.ch803

INTRODUCTION

Knowledge management (KM) targets the capture, codification, and dissemination of knowledge across organizations to enhance value. In effect, KM aims to productize and distribute knowledge as an explicit asset.

Knowledge capture and transfer across organizations can be accomplished by direct person-to-person interactions. Examples include training, mentoring, discussions, and other meetings. Knowledge can also be transferred indirectly, mediated by software applications and communication technologies. Examples include passive systems such as knowledge repositories, interactive applications such as expert systems and intelligent search engines, and systems that coordinate collective interaction such as collaborative workgroup spaces.

Within the framework of this book, these two approaches— call them *personalization* and *codification*—delineate a spectrum of strategies for managing knowledge. Organizations generally favor one strategy or the other to manage knowledge, driven by affinities with their overall business model and competitive strategy, although they often use the other in supporting roles (Hansen, Nohria, & Tierney, 1999).

This chapter introduces a methodology and supporting knowledge "engine" for productizing and distributing *performance-based knowledge*. We specifically target bodies of expertise required to perform strategic analysis and decision making as exemplified by the following kinds of critical questions: What products and services should we offer? With whom should we partner and how? How can we best defend against adversaries and prepare for disasters? Where should we invest to improve our strategic positioning for the future?

The knowledge that enables strategic reasoning is widely viewed, correctly, as tacit content that is difficult to articulate, codify, and transfer. KM literature pays relatively little attention to this kind of high-level, open-ended knowledge, despite its obvious importance to organizational performance, growth, and security over the long term. Consequently, strategic performance knowledge is often omitted from formal knowledge strategies, or "managed," at best, by defaulting to ad hoc personalization transfer methods, since its capture in documents or less inert digital forms seems problematic.

Contrary to this conventional wisdom, this chapter argues for a codification strategy for explicitly managing organizational knowledge about strategic analysis and decision making. We describe a generalized methodology and architecture for capturing and packaging knowledge about strategic reasoning in rich interactive software engines. These engines enable retention *and* sharing/dissemination of critical strategic performance knowledge at levels that are not possible from direct person-to-person transfer strategies.

Our knowledge engine architecture consists of a software platform that supports interactive modeling, "what-if" simulation, and analysis of complex situations and decisions. This platform provides tools for capturing and deploying strategic knowledge tailored to specific domains (e.g., the pharmaceutical industry, homeland security) and types of critical problems (e.g., competitive marketing strategy, change management, critical infrastructure preparedness). We describe a supporting modeling and decision-making methodology derived from scenario planning to help users apply the codified domain knowledge to solve their strategic problems.

We call the resulting knowledge-based solutions virtual decision environments (VDEs). VDE essentially provide low risk virtual "test drives," helping knowledge workers frame, explore, and compare alternate analyses, policies, strategies, or plans involving complex environments and extended time frames. The benefits of performance-based knowledge systems for strategic decision support include:

- Codifying, retaining, and maintaining best practices decision-making expertise
- Providing organization-wide availability to this expertise in actionable form
- Reducing exposure to risk (from unintended consequences)