Chapter 6.6
Becoming a Learning Organization in the Software Industry:
Is CMM the Silver Bullet?

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ABSTRACT

This chapter examines to what extent the implementation of Software Engineering Institute's Capability Maturity Model (CMM) of software process improvement enables a firm to transform itself into an learning organization (LO). It argues that even though the CMM does lead the software firm forward on the route to learning, it does not go far enough. By recognizing organizational knowledge and organizational learning as the twin pillars of the LO, the author develops a conceptual framework against which the five maturity levels of CMM can be mapped and examined. This allows for an assessment of whether the CMM serves as a silver bullet in achieving the software firm's goal of reaching the visionary state of the LO.

INTRODUCTION

Today, across the world, business firms are exposed to increased environmental turbulence and uncertainty. There is rapid change in technology and its usage, and competition in the marketplace has intensified, with customers becoming highly knowledgeable and demanding. With economic realities and priorities shifting constantly, there is now the emergence of a new global economic order in which knowledge or intellectual capital—rather than labor, machine power and capital—constitutes the most critical factor of production as well as a source of competitive advantage (Zack, 1999). Nowhere is this more evident than in the software industry. By its very nature, a firm engaged in developing software applications as its primary product shares all the features of what Alvesson terms as "knowledge-intensive" firms. These firms depict the following characteristics:

1. "Highly qualified individuals doing knowledge-based work, using intellectual and symbolic skills in work;
2. A fairly high degree of autonomy and the downplaying of organizational hierarchy;
3. The use of adaptable, ad hoc organizational forms;

4. The need for extensive communication for coordination and problem-solving;
5. Idiosyncratic client services;
6. Information and power asymmetry (often favoring the professional over the client);
7. Subjective and uncertain quality assessment." (2004, p. 21)

To survive in such a turbulent business environment and achieve global standards with respect to quality, cost and customer expectations, a software firm must not only treat knowledge as its most critical resource but also learn to be highly adaptive in everything it does with the knowledge. It must proactively anticipate emerging trends and directions with regard to the business environment, customers and technology. It must assimilate the knowledge and use it effectively to best meet the customer requirements. Therefore, the software firm must work towards building for itself an all-pervasive learning culture. It must become what is termed as an LO (Senge, 1990).

The CMM, developed by the Software Engineering Institute (SEI) at Carnegie Mellon University, is suggested to be a step in this direction (Levine, 2001). The CMM enables firms to view software development as an engineering discipline and ensure its progression from being an immature, ad-hoc process to a mature, managed process (Paulk, 1998a). Ramanujan and Kesh (2004) note that the last few years have seen a significant investment on the part of software firms to implement the CMM; in most cases, firms also a report a spectacular improvement in financial performance after they have gone through the implementation process. However, the question that remains unanswered is, how sustainable is this improvement effort? That is, does adoption of the CMM enable the software firm into becoming an LO? The aim of this chapter is to investigate this research question. This is important because after the initial fanfare associated with the CMM has died down, the initiative will continue to prove useful only if it enables a software firm to develop an organization-wide learning culture and derive sustainable competitive advantage based on knowledge.

ESSENTIAL CHARACTERISTICS OF THE LO

The idea of an LO is difficult to grasp. This is because not only is it is far from a homogeneous concept but also because the terms "LO" and "organizational learning" are used interchangeably in literature. In tracing the concept of organizations as learning systems, Yeung, Ulrich, Nason and von Glinow (1999) identify eight properties that they suggest constitute the "basics" of LOs: (1) they focus not only on learning but also in meeting organizational goals; (2) they follow a systems logic and engage in out-of-the-box thinking; (3) they build upon but are not limited by individual learning; (4) they follow the learning continuum that stretches from superficial to substantial; (5) they recognize that learning comes from many small failures; (6) they adopt a process approach to learning, understanding that learning often evolves along a predictable set of processes; (7) they give cognizance to both direct experience and vicarious experience as being useful inputs to learning; and (8) they treat learning as being important, not only for "exploiting" existing opportunities but also for "exploring" new opportunities. This suggests that the LO is an ideal or visionary state that firms aspire to reach and one that requires them to engage in transformational, organization-wide, real-time learning.

Senge defines the LO as one where "people continually expand their capacity to create the results they truly desire, where new and expansive patterns are nurtured, where collective aspiration is set free and where people are continually learning how to learn together" (1990, p. 17). Even though this gives an idea of the philosophy behind an LO, Mumford provides a definition that is more practice oriented: "The LO is one that