Organizational Project Management Models

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INTRODUCTION

Project management plays an important role in the competitive scenario, and achieved in the 1990s the status of methodology (Carvalho & Rabechini, Jr., 2005). Nowadays, there are more than 100,000 practitioners that earned the Project Management Professional (PMP®) certification from the Project Management Institute (PMI). This indicator highlights the increasing interest in project management area, especially in the IT companies, which are one of the top five industries in PMI's membership numbers (PMI, 2005).

The widely spread framework proposed by PMI called Project Management Body of Knowledge (PMBoK), now in the third edition (PMBoK, 1996, 2000, 2004), has been adopted by several kinds of project-driven organization (PMI, 2004). PMBoK clusters the main project management best practices in nine key areas.

Nevertheless, a research carried out by Standish Group (2003) showed high failure level in IT project in North America. The research involved about 13.522 projects, of which only 34% can be considered a success. The main causes for IT projects failure were related to user's commitment, manager support and requirement definition. It is important to emphasize that, regarding the project success measure in historical perspective, the success rate improved if compared to the first similar research carried out in 1999, which was just 16%.

Based on this scenario, this chapter presents the main organizational project management models in order to help companies to upgrade project performance.

BACKGROUND

Several project management models had been discussed in the academic literature concerning its effectiveness and efficiency. The models focus on project efficiency, balancing scope expectations and the available resources (Carvalho & Rabechini, Jr., 2005). However, the project management efficiency models, such as PMBoK framework, cannot provide a standard benchmark for project management competences and maturity enhancing. Thus, in order to extend the efficiency models to an effectiveness perspective, several PM organizational models have been proposed.

Nevertheless, project management efficiency models focus on the project and not on organizational issues. As Engwall (2003, p. 789) states "no project is an island" and to achieve success in this area it is important to fit project management best practices to organizational environment.

On the other hand, the effectiveness issue encompasses the organizational project management models, which promotes the strategic alignment between this area and the organizational vision. It means providing an appropriate strategic alignment and portfolio analysis, project management organizational structure, methodology and project manager carrier (Carvalho & Rabechini, Jr., 2005; Carvalho, Laurindo, & Pessoa, 2003, 2005; Rabechini, Jr., Gelamo, & Carvalho, 2005; Shimizu, Carvalho, & Laurindo, 2006).

The implementation of formal efficiency and effectiveness procedures is quite new in IT projects and organizations. There are different approaches and this article focuses on the organizational project management models. The theoretical models selected to discuss this issue are the Capability Maturity Model (CMM) (Humphrey, 1989; Paulk, Weber, Curtis, & Chrissis, 1995), Project Management Maturity Model (PMMM) (Kerzner, 2000, 2001); the Quality Systems to software ISO9000-3 (2001) and ISO 12207 (1995); and the Organizational Project Management Maturity Model (OPM3) (PMI, 2003).

CAPABILITY MATURITY MODEL (CMM)

Humphrey (1989) identifies maturity levels in the IT project development process, based on the managerial behavior found in companies. The fundamental concepts of the process maturity derive from the belief that the development management process is evolutionary. Paulk et al. (1995) identify the distinguishing characteristics between immature and mature organizations, as shown in Table 1.

Table 1. Immature organization x mature organization (Paulk et al., 1995)

IMMATURE ORGANIZATION	MATURE ORGANIZATION
• *Ad hoc*: improvised process by practitioners and managers • Not rigorously followed and not controlled • Highly dependent on personal knowledge • Little understanding of progress and quality • Compromising product functionality and quality to meet schedule • High risk when new technology is applied • High maintenance costs and unpredictable quality	• Coherent with action plans: the work is effectively achieved • Processes are documented and continuously improved • Perceptible top and middle management commitment • Well controlled assessment of the process • Product and process measures are used • Disciplined use of technology

The CMM (Humphrey, 1989; Paulk et al., 1995; Pessôa & Spinola, 1997) was developed by SEI (the Software Engineering Institute of Carnegie Mellon University) and presents five maturity levels, each corresponding to a set of structural requirements for key process areas (Figure 1).

Although each project is unique, it could be organized in a process to be applied in other projects. IT projects managers used to apply a "methodology," that is, they established the steps to be followed in order to develop a system. Another singular characteristic is the dynamic technologies breakthrough that demands continuous improvements in the development methods and management of changing process, as described in the CMM model at level 5, the highest level of maturity.

The CMM second level has a consistent project management structure and the goal of this level is to deliver projects on time. To perform this, the model has several points that must be achieved, like effort and size estimation, strong process control (such as periodic meetings between technical people and managers), and several measures to show project status more clearly.

CMM is not an adequate reference for the assessment of internal methodologies, because it was not conceived to perform this kind of analysis. ISO 15504 (1998) proposed the standard project SPICE as a more appropriated model to evaluate maturity level of specific processes. While CMM level of maturity specifies a set of processes that have to be performed, ISO 15504 establishes maturity levels for each individual process: level 0-incomplete; level 1-performed; level 2-managed; level 3-established; level 4-predictable; and level 5-optimizing. This is a different approach of CMM, because an organization does not perform a maturity level, but has a maturity profile: A maturity level is measured for each specific process. This new approach is very useful to the organization perspective because one can easily measure strong and weak points of their process and plan improvement activities. Furthermore, from the companies' point of view, it is easier to understand staged levels, as the performed processes are already predefined.

The SPICE approach defined in standard ISO 15504 (1998) had firstly influenced *CMM for Systems Engineering,* published in 1995, and more recently influenced CMM I (CMM-I1; CMM-I2), just published in 2002. CMM-I, the integration model, was enhanced in two dimensions: *scope dimension* and *evaluation dimension*.

In the scope dimension, this new model incorporated other published models and covered all project activities, not only software, as the original software CMM did, but also other engineering fields. In the evaluation dimension, CMM-Il incorporated both approaches: the traditional (called staged CMM) and the maturity profile (called continuous CMM). Figure 2 shows the continuous CMM-I representation to be compatible with the ISO/IEC 15504 standard.

Figure 1. Maturity levels (Paulk et al., 1995)