

## 5 IT PROJECT CAPABILITY (CMM)

### Purpose

One way to measure an organization's capability to perform IT projects is through a tool such as the SEI Capability Maturity Model. The Capability Maturity Model (CMM) provides a framework for improving the performance of an IT organization.

### Description

In the 1980's, the United States Air Force funded research at the Carnegie-Mellon Software Engineering Institute (SEI) to create a model for the military to evaluate software subcontractors objectively. The result was the Capability Maturity Model, published as *Managing the Software Process* in 1989. The CMM has since been revised and updated. More information is available at the SEI website:

<http://www.sei.cmu.edu/cmm/cmms/transition.html>

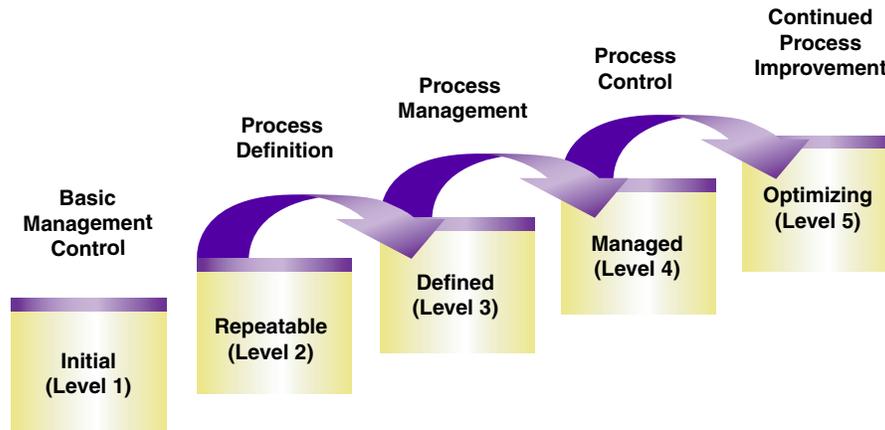
The underlying principle of the CMM is that software development is a management discipline undertaken as part of an organization's mission and strategic plan to achieve its business goals. To ensure success in using the CMM, management must first understand the needs of the organization, and accurately predict its ability to meet those needs.

The most widely accepted model for measuring the effectiveness of the software development process, the CMM has been used successfully by many organizations to identify the key areas on which to focus improvement initiatives. Although it is geared to large organizations, many of the processes involved are appropriate for organizations of any size.

The CMM is organized into five levels of organizational maturity, with each level representing a higher evolutionary stage of process capability and a progressively greater likelihood of producing quality software.

The five-stage CMM roadmap, through which an organization can mature its processes and practices, is illustrated below.

**Figure 5-1 Capability Maturity Model**



These levels are described in terms of Key Process Areas. A Key Process Area is a group of related activities considered important for an organization functioning at the appropriate process maturity level.

Many organizations may find themselves operating at Level 1, with movement towards Levels 2 and 3 posing a major challenge. Each level is described in more detail below.

### **LEVEL 1 - INITIAL**

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This level has no Key Process Areas. There may be minimal formal processes and project management disciplines, but they are typically very lax with limited controls in place. Results are unpredictable and successes are due to the efforts of individuals rather than the performing organization. Many organizations begin at this level.

### **LEVEL 2 - REPEATABLE**

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The Key Process Areas in Level 2 require the definition of and enforcement of project management practices. These practices are utilized to assist organizations control project cost, time and deliverable commitments. Successfully repeating previously mastered tasks, to avoid repetitive failures brings an organization to Level 2.

**LEVEL 3 - DEFINED**

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The Key Process Area to Level 3 is defined process management. This level focuses on processes that relate to management and software engineering activities across the Performing Organization, that are formally defined, documented and integrated into a standard process that is understood and followed. Once the Performing Organization has reached this level, and the management and software engineering processes are established successfully, continuous process improvement will have been achieved.

**LEVEL 4 - MANAGED**

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The Key Process Area to Level 4 focuses on the process controls in place to measure quality. Detailed measures of the management and software processes are collected and used to identify and correct issues with process performance. As new tools or processes are added or introduced to an existing environment, the measured data enables the Performing Organization to assess the success of the adjustments made. A managed process for these continuous improvements helps to establish and maintain a high performing organization.

**LEVEL 5 - OPTIMIZING**

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This level has only been achieved by a handful of organizations. The Key Process Area for Level 5 is to maintain continuous improvement and optimize existing processes. The Performing Organization at this level will be equipped to proactively address the strengths and weaknesses of the business processes and software engineering practices. Instead of correcting defects as they occur, quality efforts will focus on prevention and will also anticipate possible root cause scenarios. Level 5 is the premier level of optimization.

## The Benefits of the CMM

The benefits to moving up the CMM scale are major performance improvements, including:

- Improved Stakeholder and Customer satisfaction
- Improved quality and robustness of deliverables and products
- Shortened and more predictable delivery times
- Cost reductions in development and support
- A shift in organizational culture from reactive to proactive
- Implementation of performance measurements organizationally, as well as by project

The CMM helps organizations meet mission and strategy goals, better align projects to Customer needs, and better align people and processes to technology. As organizations move through the levels of the maturity model they become more efficient. At the same time, their understanding of tools and techniques and when to use them to solve a business challenge increases. Higher levels of maturity result in organizations that are better equipped to predict the impact of introducing new technology, new techniques, and new tools, enabling them to bring products to market faster, with higher quality and with more Customer satisfaction.