The Effective Use of CMMI®
NDIA Systems Engineering Division

As the Industry sponsor of the Capability Maturity Model Integration (CMMI) project, the NDIA Systems Engineering Division is committed to supporting the use of CMMI models as a basis for improving the definition, deployment, and effective implementation of development processes to improve project performance and achieve consistent business results.

When interpreted and applied effectively as a model for process improvement, CMMI [1,2] has been used by organizations worldwide to achieve measurable improvements in project performance, cost/schedule predictability, product quality, and increased customer satisfaction. CMMI has also been used effectively as an integrated framework for coordinating diverse organizational process improvement strategies and methods, such as Lean, Six Sigma, ISO, and Agile methods [3]. Many organizations, large and small [4], have used CMMI to focus resource investments toward achievement of their business objectives.

Mature organizations use CMMI models as best practices to assess their process weaknesses, to identify necessary process improvements, and to manage progress toward achievement of their business objectives in a disciplined way that produces measurable value and tangible benefits. CMMI, by its very structure, is designed to be flexibly interpreted and implemented by diverse organizations in a wide variety of application domains to help fit their business strategies and environments.

Rather than use CMMI as a model for internal process improvement, some organizations have taken a “standards compliance” approach to CMMI, with achievement of CMMI maturity level ratings their primary objective. This often leads to a “check the box” mentality focused on gathering evidence to pass an appraisal, with little emphasis on the value of the process outcomes or impact on improved project performance. This can result in lost business value, both to the organization and its customers, and has also sometimes resulted in poor business ethics and practices. The CMMI Steering Group and its partner, the Software Engineering Institute, have vigorously addressed these issues by implementing improvements to the CMMI product suite and performing rigorous quality assurance monitoring to protect the integrity of the CMMI product suite. Additional model improvements are in progress to clarify the expectations and objective criteria for implementing high maturity practices and to improve the efficiency and effectiveness of appraisals.

NDIA has chosen to address this, in part, through the following position statements on the effective use of CMMI for project development and acquisition:

1. Good processes, implemented effectively in an environment of continuous process improvement, increase the likelihood of achieving successful project performance.
2. CMMI is a model for process improvement, not a standard and not a process. Organizations and projects are encouraged to interpret and implement CMMI models in ways that adapt to their business environment and available resources with a focus on performance and business results.
3. CMMI, when used by organizations as a model for process improvement, can help define and implement effective processes that align with achieving project and organizational business objectives. Organizations making achievement of CMMI maturity levels their primary business objective may not achieve significant benefits from their investment in CMMI, and may in fact increase rather than decrease their costs and costs to their customers.
4. While some organizations have realized substantial returns on their investments from optimizing their processes at high levels of CMMI process maturity, this is a business decision that should be made based on organizational context and business objectives. Many organizations have found high value in improving processes at lower CMMI maturity levels, yet still maintaining an environment of continuous process improvement. Advancements in CMMI maturity levels should be based on a business case for improved performance benefits that outweighs the additional investment needed.
5. CMMI maturity/capability level ratings can be used as a benchmark for gauging progress in achieving organizational process improvement, but ratings are not alone a predictor of expected project performance.

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Many other business, project, and environmental factors can also be significant contributors to project success or failure.

6. CMMI was never intended as a supplier selection tool. Specifying CMMI maturity levels as criteria for selecting suppliers in acquisitions has not proven effective and is strongly discouraged. A more effective acquisition strategy is to use CMMI to probe potential risks for process areas of most importance to the customer or project, and require that suppliers demonstrate a commitment to continuous process improvement. Key measures of effectiveness can also be used to judge the historical performance of suppliers and their capability to meet the desired project performance objectives in a relevant environment. Guidance for the use of CMMI in acquisition can be found in [5].

7. The improvement actions taken as a result of appraisals, and not the benchmark ratings, are most likely to provide substantial and lasting benefits to the organization’s business results and operational effectiveness. Fear of failing ratings can often drive organizations to put disproportionate effort on appraisal preparation and dry runs, when greater returns could have been realized using much simpler and less costly approaches. Appraisal methods of various types and levels of formality [6] can be used to identify process strengths and weaknesses for prioritizing improvements.

Worldwide interest and adoption of CMMI has never been higher, and many organizations use CMMI effectively to help achieve their business goals following principles such as these. Many resources, such as those cited in the references below, are available as guidance to help organizations realize the greatest return from their CMMI investments.

References: