

Addressing a Crisis in CMMI® Application

Dr. Chuck Myers

Acquisition organizations are using CMMI “levels” very poorly. They have been so [mis]used for many years. I will make this rather blunt statement about that situation:

I consider the way CMMI levels are being [mis]used by systems acquirers to be one of the most significant threats to CMMI-DEV's long-term viability.

The situation isn't good for the acquisition community because acquiring organizations aren't getting what they're supposed to be paying for. It isn't good for the development community because one of the most effective tools for addressing “the software crisis” could go the way of the dodo (or TQM or ...).

I'm afraid I'll be rather pessimistic—bordering on cynical—in this white paper. I need to stress that I don't intend in what follows to be critical of people who perform any of the functions I will mention. I've met and been associated with many acquisition and development people over many years, and for the most part I've found that they're smart, dedicated professionals. There is a systemic problem among acquisition organizations, however, that repeatedly fosters scenarios like the one I describe in the next section.

The Perceived Problem

The problem, as a typical acquisition organization might see it, is as follows:

They are having problems with “high maturity” suppliers. After touting their “CMMI processes” in proposals, these suppliers' “disappointing” performance has included such “low” (or “no”) maturity problems as:

- failure to perform the most fundamental aspects of sound project management and administration
- poor estimates of key project planning parameters, leading to unexpected cost and schedule overruns
- poor progress visibility
- critical defects discovered in acceptance testing (or later)
- late system or component delivery
- costly rework of fielded systems.

Some of their high maturity suppliers perform well, to be sure, consistent with the maturity level rating they reported in their proposal. Unfortunately, most do not. Based on actual performance, these suppliers evidently either:

- “gamed” their appraisal to “get the number” so that they could bid on contracts or
- abandoned the practices they were using when they received their high maturity rating.

Whatever the reason, many suppliers do not deliver on expectations established by their proposals. Acquisition

programs are not getting the level of performance suppliers promise, and for which the suppliers are being paid.

Root Cause

I will here share another blunt statement:

Problems with using the development model in acquisition stem from near-total ignorance of CMMI-DEV.

People whose acquisition organizations are requiring CMMI levels as a condition for bidding know little or nothing about what they are requiring. Unfortunately, their ignorance is sometimes matched by people in supplier organizations—even in some that have achieved “high maturity.” When these two conditions of ignorance converge, the following sequence of disastrous events can be predicted with certainty:

- The people who prepare the solicitation package drop in a vague boilerplate paragraph requiring a CMMI [maturity] level (usually 3, and often just “level”). They have not read the paragraph, probably because they're short on time and don't have the knowledge they need to understand it if they did. The person who wrote the paragraph (probably years before) may not have known any more about CMMI than they do.
- In response to a vague RFP requirement, offerors' proposals tout their “Level x” processes in as many places as they can stuff them, and in the vaguest of terms. The people who write the related proposal material may not know much or anything about CMMI, so they just insert “Level x” wherever they think it might impress someone. Even if they do know something about CMMI, they know it's best not to raise customer concerns by providing more information than the customer appears to be requiring. Besides, they're probably under time pressure to meet a submission deadline and need to spend their time on the “important” parts of the proposal.
- People on the source selection board may know little or nothing about CMMI. Even if they were quite knowledgeable, there's not enough information in any of the proposals to determine if the offerors know any more about “Level x” than they put in their proposal. There certainly isn't enough information across the competing proposals to distinguish between offerors (unless there's a difference in “x”). To determine if vague RFP requirements have been met, they can go to the SEI website and check for appraisal results. “Let's see... 5 is higher/better than 3.” Check. End of evaluation for the CMMI level contract provisions. They're under time pressure, so this is an easy item to complete. They can get on with the “important” parts of the evaluation (i.e., those that they know more about).

- The supplier agreement/contract is completed. People in the acquiring organization are ecstatic that there will be no problems with [for example] software. After all, the supplier “is using their Level x processes.”
- The supplier forgets [?] entirely about two OPF specific practices:

SP 3.2 (Deploy the organization’s set of standard processes to projects at their startup and deploy changes to them as appropriate throughout the life of each project) and

3.3 (Monitor the implementation of the organization’s set of standard processes and use of process assets on all projects).

IF supplier project personnel know anything about effective process they either don't apply what they know or aren't allowed to. After all, their senior management (and perhaps many others) believe it costs more to use “Level x” processes, so using them is “discouraged.”

- Progress reviews don't include any acquirer checks to see if the supplier is actually using the managed or defined or quantitatively managed or optimizing processes associated with the maturity level touted in their proposal. Acquirer personnel generally wouldn't know what those terms mean or what “CMMI level” they are associated with anyhow. If process checks were included in the reviews, it's unlikely that anyone on the review team would be able to recognize one of these types of processes if they saw it. And they certainly wouldn't know what aspects of the suppliers work should routinely be under control based on “Level x.”
- The acquiring organization notices that their “high maturity” supplier doesn't seem to be performing any better than any of their other suppliers. Confusion and disbelief reign. Finger pointing ensues. Lawsuits follow.

Sound familiar? This is a worst-case scenario, intentionally overstated (though not by much). The simple fact is that such disasters occur all too often. At some point, people in acquisition organizations will begin to ask why they even bother with a CMMI level requirement. Actually, that's already happening. And when the sinking ship has been abandoned, and CMMI maturity levels are no longer required, how long do you think it will be before senior managers who regard high maturity as overhead abandon CMMI-DEV as well?

Lest anyone take offense at what I've written, I know there are high maturity development organizations that excel in their work. I've worked with some of them. They do as good a job as their customers' [im]maturity allows. And yes, I know that there are some mature acquirers out there. I just wish there were a **LOT** more of both.

A Solution for the Problem

The good news is that we're dealing with smart front line people (on both sides of the situation), so the problem is fixable. In theory, at least. If ignorance is at the root of the problem, the fix really is a matter of providing acquisition people with some rather fundamental CMMI-DEV knowledge. With that knowledge, the following benefits can be realized:

- Effective, useful CMMI-related proposal provisions can be prepared and included in solicitation packages.
- Offerors will have to include sufficient process-related detail in their proposals to demonstrate congruence of the operational processes they intend to use with expectations established by the maturity level they propose.
- Informed source selection board members will have the knowledge and offeror information they need to distinguish meaningfully between proposals.
- More detailed contract/supplier agreement provisions will support commensurately explicit process performance monitoring.
- Acquisition team members will be able to monitor supplier process performance knowledgeably during progress reviews to detect related problems early.

Oh, and by the way... Nearly all of this last bullet can be accomplished for existing acquisition programs in which “Level x” expectations were established by the developer’s proposal.

Problems with the Solution for the Problem

These outcomes all sound very nice, but as so often happens, reality rears its ugly head. The simple fact is that at least three conditions must be satisfied before they can be realized:

1. Appropriate, effective training must be available.
2. Acquisition personnel have to attend the training.
3. They have to apply what they learned to their work.

Regarding Condition 1

The SEI's Introduction to CMMI course won't do the trick. There. I've said it. And I don't mean to disparage the course by doing so.

The Intro course can be an adequate training experience if it is taught by an effective instructor. It really isn't suited for acquisition people, though. The course was designed for development people. Many acquirers don't have the kind of development knowledge and experience they need to relate the development-focused course material to what they do.

Even if acquirers were able to translate the material for their needs, the Intro course isn't particularly useful to them. Much of the course contact time is spent addressing

model components they don't need to know about to do their work. Time spent discussing these components can't be used to develop a solid understanding of other critical (for acquirers) model provisions.

And what of the Acquisition Supplement? Again, this one day of additional CMMI training isn't particularly useful for the topic under discussion. It addresses ACQ model components that help acquirers improve their own internal acquisition processes. It *can* be useful for satisfying some of their other needs. The supplement is totally focused on the ACQ model, though, so it provides no additional insight into using the DEV model for dealing with suppliers.

Problem: The Introduction to CMMI courses (including the Acquisition Supplement) were designed for developers doing development in development organizations. They're not a good fit for teaching acquirers how to use the DEV model for selecting and working with suppliers. Attempting to "morph" these courses to provide focused, useful training for acquirers just won't work.

Regarding Condition 3

Condition 3 is closely tied to Condition 1, so I'll discuss it next. A key indicator of effective training (as opposed to education) is that participants be able to apply what they have learned to address real-life circumstances. Exercises are among the most useful devices for developing this ability. If they are appropriately designed—and conducted effectively—exercises can be used to consolidate learning, increasing the likelihood that knowledge will be retained and used effectively and practically.

From an operational point of view, well-designed exercises provide opportunities for accomplishing real, relevant work during training. This is work that participants need to complete on the job in any event, and it often is work they didn't know they needed to do. (That's a part of the learning.) Since they are working under the watchful care of a knowledgeable instructor, they accomplish more than they would (or could) on their own. They're also more likely to "do it right the first time, so they avoid rework.

Problem: Exercises in the Intro Course and the Acquisition Supplement were designed for a developer audience, to satisfy a very different set of objectives than identified here. They don't accomplish what is needed for acquisition people who need to use the DEV model in their work with suppliers.

Regarding Condition 2

In general, acquisition people do not receive CMMI training for either the DEV or ACQ models. The reasons I've heard most often are:

- The training isn't relevant to our needs.
- We don't have the budget.
- We're too busy.

Problem: Many acquisition people have not attended CMMI training. Those who have may have found that doing so didn't help them much.

A Solution for Problems with the Solution for the Problem

I doubt that anyone who has read this far will be surprised that I've developed training that addresses the problems and conditions I've identified so far. It's a three-day workshop that I call IPS Inc.'s [CMMI®-DEV for Systems Acquirers Workshop](#) (CDSA). It uses many of the same powerful graphics that I originally developed for IPS Inc.'s [CMMI® User Workshop](#), but it addresses the related topics and concepts in a way that is appropriate for systems acquirers.

Regarding Condition 1

The workshop has been designed to address use of the DEV model by systems acquirers to select and work effectively with suppliers. It emphasizes model provisions that most directly support this objective. Coverage of other content is kept to the minimum levels necessary to provide context and to facilitate understanding. Thus, for example, the process types associated with levels are thoroughly described and illustrated. Most process areas, on the other hand, are addressed in a way that familiarizes without overwhelming. Contact time has been carefully budgeted to ensure participants have maximum exposure to those aspects of the model that will be of greatest utility in their work.

Regarding Condition 3

Approximately half of the CDSA contact time is devoted to practical exercises. Participants work together in facilitated small group and full class activities, timed for immediate application of course content to their own real-life circumstances. CDSA's topic presentation order and exercise design combine to guide participants through structured development of acquisition work products. Accumulated exercise results are collected during the workshop and provided to all participants. They take these relevant and useful materials with them back to their jobs, where they can put them to effective use immediately.

Regarding Condition 2

The CDSA Workshop addresses many of the Condition 2 issues:

- Relevance: What acquirers learn is relevant and directly applicable to their needs.
- Budget: Not discussed previously, I'm offering this training at very reasonable and attractive rates. This problem must be fixed.
- Time: I'm reminded of a sign that hung in the Grumman Proposal Center when I worked there many years ago:

"There's never time to do it right, but there's always time to do it over."

People who attend CDSA will find that they have a lot of time that they never had before. Investment is a wonderful concept.