

I have known Raghav Nandyal since the time I came to teach one of the first Software CMM courses offered publically in India. Raghav was not only one of the most active participants in this three day session, but he came to the next offering. At first I wondered whether I had failed him or he didn't get it the first time. What I quickly learned was that he had a deep and earnest goal to learn the Software CMM in the best of possible ways so he could apply it and transfer practical knowledge to organizations he worked with. At that time Raghav was working for a software house in India. Since then he has gone on to develop his own company which provides consulting on CMMI and related subjects to numerous clients worldwide.

Not only did I teach Raghav Software CMM, but I was invited to observe him in his candidacy to become a People CMM appraiser. Needless to say, he passed with flying colors. He has gone on to provide his services and interpretations of the various CMMI models provided by the SEI. One of the ways he has chosen to offer his learning, interpretations, and pragmatic approaches to using these models is through the various books he has written. He knows these models; he practices these models; and most importantly he uses them in effective and practical ways, not in any bureaucratic manner as is known to happen with quality/business models and standards. You will benefit by listening to him and heeding his advice.

In his new book **Constellations of the CMMI**, Raghav Nandyal is tackling bigger issues than only providing an interpretation of the CMMI, although he provides one of the best and easiest to understand interpretations I've seen. More importantly, from my point of view, he is boldly asking questions of the SEI and the software community about the value and the best ways to achieve maximum payback through these models. We as Lead Appraisers have often been asked to clarify some of the fuzziness in the CMMI, which the SEI has left either unanswered or may not yet have a full answer for at this time. The SEI makes changes to the model slowly and deliberately. They cannot answer every discovered defect in the model when it is discovered after release. We all need to wait for the next model version. While the new versions are evolved using experiences learned, for some aspects of the model the learning can take a long time.

Let me give an example: The initial CMM was developed by the SEI based on work done at IBM in the early 1980's where we developed a "model" and "method" for IBM internal assessments. My group developed that model and method in 1983. We had little data when we first began the work in IBM as to what were best practices, but we had a foundation that was proven in instances. These instances were then generalized into an IBM approach and then became further generalized into SEI's CMM in the late 1980's. While I believe the generalization extended by the SEI added value to the software community, there still was very little data about what was a Level 4 and Level 5 organization when the CMM was issued. Indeed, until the early 1990's there was no organization of record that was a Level 4 or Level 5 even in the SEI's accounting. There was one project in IBM Houston for the Space Shuttle which was determined to be Level 5, but it was not yet at the organization level in IBM Houston.

Over the 1990's, various organizations used the model, learned from it, and were assessed at level 4 or Level 5. The data and learning from these assessments seemingly proved to SEI that the model was sufficiently correct for wide use. Let me digress to acknowledge that with the CMMI, SEI has a model which can only exist at a generic level in an attempt to fit across the many diverse types of organizations to which it is being applied. This is necessary if it is to be applied across a wide population but brings inherent issues. Some of these issues are:

- 1) The CMMI model can only approximate giving a "how to do" approach. It can at best provide a "what to do" approach rather accurately, which even the SEI acknowledges. The SEI denies they give any "how to dos", but even this is debated in the user community.

- 2) The model offers theory in some cases, since there is still simply not sufficient evidence that the model feature is used, or should be used in *all* organizations as now required by the SEI - especially with the SEI's heavy emphasis on advanced statistical technique application in all level 4 and Level 5 organizations.
- 3) The SEI continues to evolve their interpretation of what is a *must* and thus necessary to satisfy a level in the model. Some of this is acceptable since the software community is still learning how to use the best engineering practices correctly and consistently. But this often leads to confusion as to what must be done by users, who then can overdo or not do enough.
- 4) While the SEI states that alternative practices are acceptable, they seem adamant about some very specific ways on "how to do" Levels 4 and 5 practices. If an organization does not show these specific ways with sufficient evidence, they could lose the appraisal rating when SEI audits the Level 4 and 5's, all of whom are targeted for audits by SEI. This can be frustrating to organizations that are very successful meeting their business objectives, but do not use statistical techniques the way the SEI requires.

These issues do not mean that the CMMI is not useful. It is very useful and will continue to be useful, unless the SEI aggravates the user community which would only make them seek out other models or standards to benchmark their capability or meet their business objectives. I do not want the CMMI to dissipate into non-existence and do not think it will, although some feel that is a likely outcome. It is a tool and as with all tools the user needs to understand firstly, what problem they want to solve and secondly, which tool best meets that need.

This suggests that the CMMI may not be the most useful tool for all organizations. I believe and know this to be true based on over 45 years of work in the software community. Raghav raises the same questions and suggests that when the user understands these two points just noted, then the CMMI will be most useful to them.

At the same time, there are organizations that must and should be using the CMMI, but for some reason are not. This is a true regret, since there is so much in this model that will particularly help many of these organizations, when they know how to use it properly. None of us want to fail, none of us come to work to fail, but sometimes we cannot see our way out of the mire of a struggling organization. This is when a good understanding of how to use CMMI can be most helpful. Follow Raghav's suggestions and learning and I expect your organization will benefit from this book.

Look particularly at his discussion on Cost of Quality (COQ). I have always been a believer that this one measure is prime in helping organizations best see how they run their software business. I am confused when I discuss the value of measuring COQ with organizations when I find they are not. How could they not be using it? But what a pleasure it is to see the eyes of the executives open wide when they realize that improvement in COQ goes right to the bottom line. Now they buy in and buy in big time. With this comes continuous process improvement in the best of ways.

Read Raghav's discussions on CMMI requirements in Level 4: especially about Process Prediction Models, establishing Process Performance Baselines, Controlling sub-processes and ensuring Data Quality when doing analysis. These are not only well written but show Raghav's deep understanding of what is required in a practical way for organizations to address continuous process improvement.

If you are reading this Foreword and haven't yet bought the book, I advise to make the purchase, read it, contact Raghav should you have questions, and most importantly use it to your best advantage.

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