

Achieving delivery excellence using the Capability Maturity Model Integration

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Service delivery organizations are constantly looking for ways to deliver their services better, faster and cheaper. According to a CIO survey report conducted by Accenture, high-performing IT organizations who master this "...spend significantly less time maintaining and fixing systems and significantly more time building new systems."

The difficulty comes in balancing these potentially conflicting goals in order to ultimately deliver excellent service and meet or exceed customer requirements. It is not surprising that quality frameworks that help provide guidance about delivery excellence are increasing in popularity. The Capability Maturity Model Integration for Development (CMMI®-DEV) has taken a leading position for systems development and maintenance. CMMI-DEV builds on the success of its predecessor, the CMM for Software, which has been the global standard for software development excellence since the early 1990's.

Capability Maturity Model Integration defined

Accenture continually looks for ways to deliver higher quality, innovative IT solutions that help our clients on their journey to becoming a high-performance businesses and governments. In our quest, we reviewed many industry standards, including CMMI-DEV. Simply put, CMMI-DEV is a set of guidelines for 22 Process Areas related to systems development and maintenance best practices. These Process Areas are grouped into Engineering, Project Management, Process Management, and Support topics. Each Process Area has a set of defined goals and includes topics such as Requirements Management, Risk Management and Product Integration. CMMI-DEV is part of a set of Capability Maturity Models produced at the Software Engineering Institute at Carnegie Mellon University and derives its "integration" name because it pulls together best practices from several previous models, including the CMM for Software, Systems Engineering CMM and Integrated Product Development CMM.

The premise of the model is that the most successful systems development and maintenance organizations are those that do these twenty-two things well. CMMI-DEV organizes the Process Areas into five stages, or levels, of process maturity. Maturity Level 1 organizations have satisfied none, or few, of the goals in the model, while Maturity Level 5 organizations have satisfied the goals for all Process Areas. While Maturity Level 1 organizations may be successful, they are typically chaotic and reliant on 'heroes' who make them successful primarily through hard work. Higher maturity organizations have more consistent results and proactively improve their quality.

Impressive benefits

We used CMMI-DEV to enable our global methods to meet or exceed industry standards and to drive consistency across our internal groups—thereby achieving delivery excellence throughout our business. We found there were a number of benefits of using the Capability Maturity Model Integration as one part of a well thought out and executed delivery excellence program. A key benefit of using CMMI-DEV is process industrialization: CMMI-DEV provides an objective framework that organizations can use to ensure processes are well defined and being followed. We used CMMI-DEV for this purpose and realized 5:1 return on investment (ROI).

Beyond process industrialization, there are several other benefits that have been reported in a Software Engineering Institute (SEI) study of CMMI-DEV implementations¹, including:

- **Cost:** 4.5 percent decline in overhead and up to 33 percent decrease in the cost to fix defects
- **Schedule:** 30 percent increase in productivity, 50 percent reduction in release time, increase of milestones met from 50 percent to 95 percent
- **Quality:** reduction in defects found from 6.6 to 2.1 per thousand lines of code (KLOC)
- **Customer Satisfaction:** increase in client satisfaction scores and award fees
- **Return on Investment:** 5:1 to 13:1 ROI

Not every organization can expect the same degree of benefits. In our experience, the best way to understand which benefits might apply to your organization is to conduct a baseline assessment and use information specific to your organization to evaluate opportunities for improvement.

For instance, some organizations have significant problems with frequently changing requirements and benefit from focusing there first. Other organizations have difficulty with effective estimating and project management.

Capability Maturity Model pitfalls

Using the CMMI-DEV as a basis for process improvement is by no means as simple as following a set of instructions. The model itself provides a list of requirements, not instructions on how to implement processes which meet those requirements. CMMI-DEV does include content about how to 'institutionalize' your processes (institutionalization refers to ensuring that processes become part of the organization's culture), but otherwise provides little guidance on implementation. Because of this lack of implementation guidance, organizations can make some critical mistakes:

Setting the wrong or incomplete goals

Do not confuse achievement of CMMI-DEV goals with achievement of business goals. If your organization gets assessed at CMMI-DEV Maturity Level X, and you proclaim victory without considering whether your business goals have been met, you have made a fundamental mistake. Before even deciding whether CMMI-DEV will be useful for you, start by understanding your business strategy and then decide if CMMI-DEV can help you achieve that strategy. The following are some examples of business goals that can be supported by CMMI-DEV:

- Increase customer satisfaction by increasing the quality of your systems that support the customer directly, or that support employees who interact with the customer.

- Increase the responsiveness of your organization by reducing the delivery time of your systems development projects.
- Increase the productivity of the systems organization, or conversely, reduce the cost of the systems organization while maintaining the same delivery speed and quality.

Believing CMMI-DEV will fix all or most of your organization's problems

CMMI-DEV may help you solve some fundamental systems problems, because it can help improve the rigor and predictability of your project management and systems development processes. However, if your problems are not related to project management, systems development, or maintenance, you may need to look elsewhere. For example, CMMI-DEV has little or no coverage of topics such as customer relationship management, human performance, outsourcing, contracting, or technology infrastructure management.

Focusing your improvement program on CMMI-DEV by itself

An effective business-oriented process improvement program will keep the organization focused on real business results and will use the CMMI-DEV, and other quality frameworks, to help achieve those results. The CMMI-DEV will help you focus on sponsorship, training, measurements, documentation, and verification of processes. It will also provide an excellent starting point for systems development and maintenance best practices. However, there are many other aspects of a robust improvement program that are also critical: communications program, human performance, people change management, tool and technology improvements, organizational reengineering, reskilling/retraining

your workforce. You may also need to supplement CMMI-DEV with best practices from other frameworks, such as eSourcing Capability Model for Service Providers (eSCM-SP), Information Technology Infrastructure Library (ITIL®), ISO® 9001:2000, or Six Sigma®.

Conclusion

CMMI-DEV can be a valuable and important part of your delivery excellence program, but you need to use it within the context of a complete program focused around business strategy and goals. Otherwise, your delivery excellence program is likely to take longer, be more expensive, be less sustainable, and not realize the benefits. You might even find that the problems it helped you solve are not actually the ones that are most critical to your business.

CMMI-DEV provides guidance that supports you in enhancing your processes and your ability to deliver. Business and governments that are committed to improving their performance will find that CMMI-DEV can help support a program to achieve customer satisfaction, competitive superiority—and, ultimately, high performance.

For more details about the specifics of the CMMI-DEV, visit <http://www.sei.cmu.edu/cmmi/>

Notes

1 CMU/SEI-2003-SR-009

Demonstrating the Impact and Benefits of CMMI®: An Update and Preliminary Results.

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