U.S. Government Agency Increases Software Productivity by 34% Using CMMI®

THE BUSINESS NEED

In an effort to improve its software development, an agency within the U.S. government established an initiative to improve how software is developed for projects at its centers and with its industry partners. The goal was to use policies and requirements to improve quality, reduce defects, and improve productivity.

The agency identified three focus areas and related goals:

1. **People.** Expand the skills and knowledge base of individuals developing the agency's software by improving the hiring and training process. Create consistent best practices to follow to help the agency determine the most qualified partners to work with.

2. **Process**. Decrease or eliminate any late deliverables or increased costs that result from issues in scheduling. Put processes in place to focus on continuous improvement. Increase software quality and reliability.

3. **Technology.** Achieve consistent performance from all software engineering products built internally and externally by vendors. Increase use and adoption of the latest software engineering technology.

THE SOLUTION

Previously, the agency had implemented an ISO 9000 process for project management and quality control. While this demonstrated that its divisions had appropriate documentation, it did not prove they had the capability to deliver consistent, defect-free performance.

In an effort to prove its capabilities, the agency required all of its divisions, as well as its contract partners and suppliers, to earn a CMMI® maturity level 2 or 3 rating. Implementing CMMI would move its divisions toward a standard set of processes that everyone could follow.

The use of the CMMI model was included to make sure agency projects are supported by software development organizations having the necessary skills and processes in place to produce reliable products within cost and schedule estimates. The CMMI requirement provides the agency with a methodology to determine these factors:

- Measure software development organizations against an industry-wide set of best practices that address software development and maintenance activities applied to products and services.

- Evaluate and compare the maturity of an organization's product development and acquisition processes with industry state of the practice.

- Measure and ensure compliance with the intent of the agency's process-related requirements document, using an industry-standard approach.

- Assess internal and external organizations' software development processes.

- Identify potential risk areas within a given organization's software development processes.

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Division 1

One division of this government agency is the "go to" organization for process expertise; and it frequently provides training and mentoring to other software projects. To earn maturity level 3 rating, it implemented CMMI for Development, version 1.3 (CMMI-DEV, V1.3), to achieve the following goals:

- Created a vast suite of process assets such as templates, checklists, forms, and methods to facilitate product development

- Developed lean operating procedures

- Produced tools to ensure comprehensive life-cycle traceability and relationship identification

- Institutionalized work instructions at the project and organizational levels

- Introduced peer-review methods and tools that support complete, consistent, and accurate results

- Provided role-based process training through the agency's online training tool

This division was the first to earn a CMMI maturity level 3 rating. For 10 years it has consistently applied process improvements to its software in support of its objectives. As a result, it has achieved many efficiencies and has become a trusted adviser throughout the organization for all things process related. It has reported an increase in productivity and a reduction in defects.

OVERALL RESULTS

Eight of the 10 divisions of this government agency have adopted CMMI and earned maturity level 2 or 3 ratings or higher. This has become the model against which the organization measures the capabilities of the contractors it hires and has been a key factor in maintaining quality and increasing productivity.

Division 2

Another division of this agency is responsible for research, design, development, and testing innovative technology. To earn a maturity level 2 rating, it deployed CMMI-DEV, V1.3, to achieve these objectives:

- Updated all operating processes and templates

- Implemented goals to ensure processes were defined, communicated, repeatable, and consistent across the division to help stay on budget and on schedule

- Worked to better organize and document the training needs of all employees

Through its process improvements, this division has been able to estimate costs consistently and more accurately so that projects can meet budgetary requirements. It is also able to predict project timelines more consistently to prevent deadline extensions.

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One of the agency's software organizations first achieved a CMMI maturity level 2 rating in 2003 and achieved a CMMI maturity level 3 rating in 2007. Following those process improvements from using CMMI, cost growth, which had spiked in previous years, fell by 50 percent, while productivity increased by 34 percent and operations defect rates fell by two-thirds.

Other results from the implementation of CMMI at this agency:
- Created consistent processes used by different teams
- Implemented the tools needed to measure results
- Increased the use of metrics
- Increased the quality while reducing defects
- Enhanced productivity
- Promoted a culture of continuous improvement

Sharing knowledge and communication benefited the agency in several ways:
- Facilitated better communication among all stakeholders
- Improved infrastructure through the creation of a central website that hosts all process assets
- Improved awareness of project status so that the teams involved could recognize and solve potential problems before they occur
- Increased workforce knowledge base, making it easier to reconstitute a team on a new project
- Conducted better training through standardized documentation
- Enhanced communications with team members about achieving process improvements

BUSINESS BENEFIT

By having consistent requirements in place for its people, process, and technology, this government agency is putting the most qualified personnel and contractors and suppliers in place to help it focus on the continuous improvement and success of its software.

About CMMI® Institute

CMMI Institute (**CMMI**institute.com) is the global leader in the advancement of best practices in people, process, and technology. The Institute provides the tools and support for organizations to benchmark their capabilities and build maturity by comparing their operations to best practices and identifying performance gaps. For over 25 years, thousands of high-performing organizations in a variety of industries, including aerospace, finance, healthcare, software, defense, transportation, and telecommunications, have earned a CMMI maturity level rating and proved they are capable business partners and suppliers.

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