What CMMI Does for Our Industry - And What It Doesn’t

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Northrop Grumman Mission Systems & CMMI

- Strong and continued commitment to CMMI
  - 56 SCAMPI appraisals (39 external) conducted since 8/02
    - 163 projects appraised (115 external)
    - 19 organizational appraisals (67 projects) on PARS Site
      - 14 are Level 5
      - 5 are Level 3
    - NGMS organizations regularly reappraise within 3 years
  - NGMS is committed to using our processes
    - Require all organizations to formally confirm their intent to use NGMS processes prior to proposal release
    - Every project undergoes post award process review within 30 days of start up
    - Process status is a part of every internal program review

We invest in CMMI because we’ve found it’s worth the effort.
What CMMI Is Intended to Do?

- Provide a model of Development best practices
  - Soon to be expanded to include Acquisition and Services
- Provide a framework for our organizational processes
  - Provide an outline for achieving organizational maturity through exploitation and repetition of those practices
  - Provide informational examples of practices and documentation
- Provide a means for organizations to measure themselves using a standard method (SCAMPI)
- Provide a means to roughly compare achievements against other similar organizations (Maturity Levels)

CMMI provides a map. Organizations provide the start and end points. Then they create the directions through organizational practices.
What CMMI Does for NGMS?

- Common model for understanding how to execute in complex development environments
  - Software and systems engineers now have an integrated model upon which to build an approach
  - Repeatable understanding of execution from project to project and from project managers to executives
- Executive management has reference points to manage quantitatively and repeatedly
  - Measures are understood both by developers and reviewers
  - Estimates are based upon similar work and scope
  - Can easily compare similar programs
- Personnel can migrate to the next project, even in a different division, and know what to expect and how they are expected to perform
  - Start up is easier and more predictable

The real payoff from CMMI is measurable results!
What CMMI Doesn’t Do!

- CMMI (and Organizational Process) doesn’t mean that projects will automatically use them
  - New managers or those joining from other organizations may not be convinced yet
  - NGMS reviews early and often to ensure process use
- CMMI doesn’t specify efficient and effective practices – it defines what to expect
  - Organizations have to create their own effective practices
  - NGMS uses Six Sigma to measure process effectiveness
    - 745 Six Sigma projects since 2001 have improved our processes and saved an estimated $130M
- CMMI can’t guarantee error-free performance
  - Early detection of problems and effective responses are key to minimizing impacts
  - Even the best estimates based upon poorly understood requirements can’t be accurate.

CMMI ratings are not silver bullets. You still must work to gain the benefits!
Project Management Maturity

- Project Planning is where it all starts
  - Repeatable and executable to eliminate surprises
- Estimating what it really will require
  - We focus on accuracy in estimation as a basis for determining the feasibility of achieving the desired results
  - Include factors to cover historical variations
- Understanding your risks and how to mitigate them makes all the difference
  - Puts the project and the executives on the same page
  - Gives the customer a view of development risks that they normally can’t get

It all starts with an executable plan
Striving for Repeatable Execution

- Organizations carry techniques from one project to another – especially within core business areas
  - Organizational Training defines skill and process training for the organization and the project
- Process adherence emphasizes repeatability
  - Organizational Process Focus minimizes unnecessary variants (when used with reason)
  - Project Planning is the means to create it
  - Quantitative Management and Project Monitoring and control are often used to ensure compliance
- Enforcing use of organizational practices
  - Key to success from the outset
  - Start up kits provide the templates and direction starting with capture teams

Discipline drives out chaos!
Building the right thing, the right way!

- First you have to know what to build
  - Requirements Development & Requirements Management
  - Then you have to build it right
    - Technical Solution & Product Integration
    - And ensure it is built right and you built the right thing
      - Validation and Verification
- But you fail if you don’t build it on time and within budget
  - Project Planning
  - Project Management & Control
  - Quantitative Management
- And the initial estimate is made before the requirements are agreed upon (There is lots of room for underestimation)

Customer trust gained by repeated success - PRICELESS!
Using “Inch-Pebble” Planning and Monitoring

Monitoring in detail helps get the effort directed to where it will do the most good & having a VP & GM interested doesn’t hurt either.
## Mitigation to Manage Schedule & Performance

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**Any program can experience delays in sub tasks. Keeping the minor delays from spreading makes for program success.**

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Results That Impress Executives

- During the last 4 years:
  - Projects started using NGMS mature processes haven’t experienced pervasive problems
  - When & if problems do occur (and they will regardless of process)
    - Problems are identified before causing severe damage
    - Action is taken quickly to return the projects to effective performance
    - Requirements Development that uncovers misunderstandings is the biggest cause of variations

- Since CMMI was adopted:
  - Customer funding problems are the #1 reason for appearing on the problem projects list
  - Most projects that are reported for performance problems predate CMMI organizational adoption

Executives don’t like surprises
A Development Organization’s ROI in CMMI

- An organization’s life blood is winning new projects
  - Estimation validity gains support from executive management to pursue aggressively and price competitively
  - Repeatable performance is key to support both when bidding and during development
- Risk isn’t just a dirty word in Government
  - Executives view Proposal Risk, Program Risk, & Execution Risk equally
  - Identification and mitigation of risk using proven and trusted process is key to gaining executive support
- Individuals trained on mature programs migrate easily to new starts
  - Takes one more risk out of start up

We invest in CMMI because it pays off!