How to prepare your organisation to adopt and implement CMMI Successfully

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Nexor
Agenda

■ Andy
  ■ Nexor History
  ■ What is CMMI?

■ Irene
  ■ Nexor’s Approach to CMMI
  ■ Lessons Learnt

■ Andy
  ■ How do you successfully adopt CMMI?
Nexor – who we are....

- UK Technology Company:
  - Approx 40 staff
  - 70%+ Technical Staff
  - 90% of which are university graduates

- Established in 1990 and based in Nottingham; originally a Spin off company from the University, now privately owned

- Produce Secure Messaging Guard and Gateway products for a variety of Industries including Government, Financial & Defence

- Specialise in interoperability and security
Capability Maturity Model (CMM) History

- CMM was funded by the US Air Force to create a model for objective evaluation of software subcontractors

- Developed by the Software Engineering Institute (SEI) at Carnegie-Mellon University and published in 1989 – CMM

- A number of CMM models evolved over time

- These models were superseded by CMMI (Integration) in 2000

- Currently: CMMI-DEV(Development), CMMI-ACQ(Acquisitions) and CMMI-SVC(Services)
Capability Maturity Model Integration – CMMI Development

- Provides model of best practice
- Can be used to guide improvement across a project or a whole organisation
- CMMI helps integrate traditionally separate organisational functions
- Provides a framework for process improvement goals & priorities
Maturity Levels

Characteristics of the Maturity levels

Level 1
“Initial”
Processes unpredictable, poorly controlled and reactive

Level 2
“Managed”
Process characterized for projects and is often reactive.

Level 3
“Defined”
Process characterized for the organization and is proactive. (Projects tailor their process from the organization’s standard)

Level 4
“Quantitatively Managed”
Process measured and controlled.

Level 5
“Optimizing”
Focus on process improvement.

NEXOR®
# Key Process Areas

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Name</th>
<th>Area</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>REQM</td>
<td>Requirements Management</td>
<td>Engineering</td>
<td>2</td>
</tr>
<tr>
<td>PMC</td>
<td>Project Monitoring and Control</td>
<td>Project Management</td>
<td>2</td>
</tr>
<tr>
<td>PP</td>
<td>Project Planning</td>
<td>Project Management</td>
<td>2</td>
</tr>
<tr>
<td>SAM</td>
<td>Supplier Agreement Management</td>
<td>Project Management</td>
<td>2</td>
</tr>
<tr>
<td>CM</td>
<td>Configuration Management</td>
<td>Support</td>
<td>2</td>
</tr>
<tr>
<td>MA</td>
<td>Measurement and Analysis</td>
<td>Support</td>
<td>2</td>
</tr>
<tr>
<td>PPQA</td>
<td>Process and Product Quality Assurance</td>
<td>Support</td>
<td>2</td>
</tr>
<tr>
<td>PI</td>
<td>Product Integration</td>
<td>Engineering</td>
<td>3</td>
</tr>
<tr>
<td>RD</td>
<td>Requirements Development</td>
<td>Engineering</td>
<td>3</td>
</tr>
<tr>
<td>TS</td>
<td>Technical Solution</td>
<td>Engineering</td>
<td>3</td>
</tr>
<tr>
<td>VAL</td>
<td>Validation</td>
<td>Engineering</td>
<td>3</td>
</tr>
<tr>
<td>VER</td>
<td>Verification</td>
<td>Engineering</td>
<td>3</td>
</tr>
<tr>
<td>OPD</td>
<td>Organizational Process Definition</td>
<td>Process Management</td>
<td>3</td>
</tr>
<tr>
<td>OPF</td>
<td>Organizational Process Focus</td>
<td>Process Management</td>
<td>3</td>
</tr>
<tr>
<td>OT</td>
<td>Organizational Training</td>
<td>Process Management</td>
<td>3</td>
</tr>
<tr>
<td>IPM</td>
<td>Integrated Project Management</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>RSKM</td>
<td>Risk Management</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>DAR</td>
<td>Decision Analysis and Resolution</td>
<td>Support</td>
<td>3</td>
</tr>
<tr>
<td>OPP</td>
<td>Organizational Process Performance</td>
<td>Process Management</td>
<td>4</td>
</tr>
<tr>
<td>QPM</td>
<td>Quantitative Project Management</td>
<td>Project Management</td>
<td>4</td>
</tr>
<tr>
<td>OID</td>
<td>Organizational Innovation and Deployment</td>
<td>Process Management</td>
<td>5</td>
</tr>
<tr>
<td>CAR</td>
<td>Causal Analysis and Resolution</td>
<td>Support</td>
<td>5</td>
</tr>
</tbody>
</table>
Appraisal

- CMMI offers an ‘Appraisal’ process by which you can be formally accredited a maturity level rating.

- Why would you wish to be Appraised?
  - Determine how well processes compare against CMMI best practice, and identify areas in which improvements can be made.
  - Inform external customers and suppliers how well your processes conform to CMMI best practices.
  - To meet contractual requirements of our customers
Types of Appraisal

- Standard CMMI Appraisal Method For Process Improvement (SCAMPI)
  - Conducted by SEI-authorised lead appraisers

3 Classifications of SCAMPI

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Class C</th>
<th>Class B</th>
<th>Class A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of objective evidence</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Ratings generated</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Resources needed</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Team Size</td>
<td>Small</td>
<td>Medium</td>
<td>Large</td>
</tr>
</tbody>
</table>
Nexor & CMMI
Why CMMI for Nexor?

**Differentiation:**
- Internationally recognised
- Limited number of defence contractors outside US

**Superior Weapons and Tactics:**
- Changes business model
- Least cost compliance
- Benchmarking against industry best practice

**Improved Efficiency of Processes:**
- Reduce quality problems
- Visibility of progress
- Predictability
Nexor’s CMMI journey commences…

Initial commitment: March 2006

Identified Consultant: Clifford Shelley of OSEL

Informed staff
- To formally adopt CMMI as a business improvement methodology; and
- To progress through CMMI Model to Maturity Level 5

Set up CMMI Project Board
- Remit to drive the initiative
- Project Board members included CEO
Approach – initial actions…

Within first two months:

- **Involved as many staff as possible**
  - Overview and introduction to CMMI to all

- **Identified and trained a Working Group**
  - More in depth with an Introduction to CMMI Methodology

- **Carried out an initial status investigation**
  - Mapped CMMI Process Areas to Nexor’s business areas and agreed starting point of Project Management
Approach – so we started…

- Set up cross-functional Working Group
  - Technical Project Manager
  - Service Delivery Manager
  - Product Architect
  - Support Engineer
  - Business Improvement Manager

- Brainstormed – what doesn’t work for you?
# Project Management – initial findings…

<table>
<thead>
<tr>
<th>Process</th>
<th>Folder Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge process is there but not when it should be used</td>
<td>Not the right type of folders or templates</td>
</tr>
<tr>
<td>No perceived value in it</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PID</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason for raising PID not clear</td>
<td>Who sees risks</td>
</tr>
<tr>
<td>PID never referred to again</td>
<td>What happens to risks?</td>
</tr>
<tr>
<td>Not always a PID</td>
<td>How are they tracked?</td>
</tr>
<tr>
<td>Who reads/reviews the PID</td>
<td>Escalation unclear</td>
</tr>
<tr>
<td>Full PID very repetitive</td>
<td>No close off of actions</td>
</tr>
<tr>
<td>Lots of cut and paste</td>
<td></td>
</tr>
<tr>
<td>When should we use a mini-PID or full-blown PID</td>
<td></td>
</tr>
<tr>
<td>What differentiates a large project from a small project?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Milestones</th>
<th>Timescales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who sees milestones</td>
<td>What happens when things slip?</td>
</tr>
<tr>
<td>How are milestones tracked?</td>
<td>Knock-on/cascading effect not considered</td>
</tr>
<tr>
<td></td>
<td>Delays normally recognised/caught, but informally</td>
</tr>
</tbody>
</table>
### Projects Summary

**Open Projects: 15**

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Manager</th>
<th>Stakeholders</th>
<th>Start Date</th>
<th>Progress</th>
<th>Phase</th>
<th>Projected End Date</th>
<th>Last Review</th>
<th>Risks</th>
<th>Related to</th>
<th>Edit</th>
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</thead>
<tbody>
<tr>
<td>CABGTRAIN</td>
<td>ABG Training &amp; Integration</td>
<td>STW, SHH, RHB, AJH</td>
<td>18-06-2008</td>
<td>Red</td>
<td></td>
<td>28-02-2009</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Other CMMI Process Areas...

- Set up other cross-functional working groups
  - sometimes incorporating internal audit
  - implementing changes based on 80/20 rule

- Created set of Policies
  - Project Board, Departments, Working Groups

- Incorporated focus on Levels 4 and 5
  - pull Process Areas from Levels 2 and 3
  - gave impetus to measurement (GQM)
More recently…

- Re-think about approach
  - no realistic feeling about where we were CMMI Level-wise

- New aim identified in January 2008
  - formal SCAMPI assessment to Level 3 by end 2008

- Walkthrough in April 2008
  - focussing on CMMI Level 3 Process Areas

- Developed improvement plan based on findings
  - assigned Owner to each Process Area

…then started to look at formalities of CMMI assessment
Then reality kicked in…

- Issued RFP and gathered information
  - found very different approaches

- Found lots of mandatory associated activities
  - time to prepare assessment plan, producing PIID
  - Several SCAMPI Bs, before SCAMPI A
  - Documentation reviews

- Return on investment for ‘tick in box’ not justifiable

Therefore:
- Decision to maintain process improvement based on CMMI through informal assessment
  - so if market requirement changes, Nexor can move forward swiftly
Nexor’s Lessons Learnt – Good…

- Working groups – cross functional
  - gets people to talk to each other

- Engage and involve all staff
  - let people who do the work own the process improvement

- Policies set the framework (the ‘what’) 
  - let relevant people put in place the ‘how’

- CMMI model can be adopted / adapted 
  - approach can be used in a wider context 
  - checklists work as well as complex procedures
Nexor’s Lessons Learnt – Not so good…

- **CMMI wording**
  - not always easy to comprehend what is actually meant

  “The purpose of Quantitative Project Management (QPM) is to quantitatively manage the project’s defined process to achieve the project’s established quality and process-performance objectives”

- **Easy to be naïve at outset**
  - optimistic view of complexity, cost and time required

- **Easy to lose what has been gained**
  - improved project management but over time it has become complex

- **Measure only what matters to the business**
How to prepare your organisation to adopt and implement CMMI Successfully…
How to approach your CMMI journey

- Find support from someone has expertise in CMMI and has had real experience
- Ensure buy-in from the Board – also senior managers
- Beware glass ceilings
- CMMI books are not easy to understand; try different sources
- Communicate regularly and train staff appropriately
How to prepare to implement CMMI…

- **Know your business priorities**
  - walkthrough, gap analysis, strengths/weaknesses, SCAMPI C

- **Establish CMMI Project Board or Team**
  - to monitor activities and authorise resource

- **Devolve responsibility for improvements to those who do the work**

- **Understand commitment and cost**
  - is the benefit in a formal assessment or just adopting the CMMI model?
Implementing CMMI…

And finally…

*For CMMI to be fully effective it has to be, and be seen to be, part of ‘business as usual’*
Questions?