Practical Process Improvement: the Journey and Benefits

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Overview

- Why the Carnegie Mellon University Capability Maturity Model (CMM)?
- Business benefits realised by IBM, clients and staff
- About IBM Application Management Services
- The improvement approach
- Facets of Improvement
- The lessons learned
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Why CMM?

- $412 million saving
- 145% productivity improvement
- 58% reduction in production problems
- 94% reduction in severity 1 problems
Why CMM?

Globally accepted method to assess capability

Model provides a logical and proven progression path for implementation
- Level 2 – Basic Project Management
- Level 3 – Organisational focus, advanced Project Management
- Level 4 – Quantitative Management
- Level 5 – Continued optimisation

Significant productivity and quality improvements

ROI Return on Investment of approximately 8 times
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Cumulative Cost Savings
(compared with year 1 productivity)

$19, $73, $137, $183, $236

1998-99, 1999-00, 2000-01, 2001-02, 2002-03

$0, $10, $37, $73, $108, $176, $200, $236

$A Millions

Maintenance
Development
Account Achievements

- 145% improvement in productivity since outsourcing
- 58% reduction in production problems & 94% reduction in severity 1 problems over the past 4 years
What about the employees?

- **Effective Communication**
  - CMM provides a common language

- **Improved morale**
  - More stable work environment
  - Better balance of personal and professional life
  - Reduction of ‘all hand to the pumps’ crisis situations

- **Lower staff turnover**
  - Quality people are unlikely to stay long in an overstretched and highly stressful environment

- **Better Customer Relationships**
  - Agreed, quantitative service goals
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About Application Management Services (AMS)

- Part of IBM Global Services responsible for software development, enhancement and maintenance

- In July of 1997, IBM Australia began providing application management services in a major outsourcing contract
  - 2,500 staff, 17 locations, up to 1,500 km apart
  - 370 applications, 55,000 PC workstations
  - Mix of project size, technology, processes, cultures
  - “One of everything”

- 1,000 projects and 3,000 deliverable work products a year

- Over a six year period, IBM transformed from a “Level 1” environment to be formally assessed at CMMI Level 5
IBM ANZ AMS CMM Journey

- CMM Level 3 achieved by a major client account in 1996
- Level 1 outsource account (2,500 staff) commenced June 1997
- Within 2 years, AMS had been assessed at CMM Level 2
- By April 2001, AMS had achieved CMM level 3 for its outsourced commercial accounts (approx 1,500 employees)
- AMS Commercial Delivery achieved CMMI Level 5 in November 2003
- AMS IBM Account achieved CMM (SW) Level 5 in March 2004
IBM’s AMS A/NZ organisation has received the IEEE Computer Society Software Process Achievement Award for 2004.

The award recognises organisations which have demonstrated significant, sustained and measurable achievement in software process improvement.

This is only the 7th time the award has been presented in the 11 years since it was established.
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IBM’s Application Development Effectiveness model takes a holistic view of the AD organization

Beliefs, Expectations, Attitudes, Vision

Quality, Time, Productivity, Cost, Impact, Defects, ROI, Value, Satisfaction

Experience, Technical and Management Education,

Skills

Culture

Methodology

Technology

Organisation

AD Process

Roles, Responsibilities, Structures, Resources and Resource Career Paths

Procedures, Methods, Techniques, Standards, Guidelines

Tools, Architectures, Physical Environment
Our improvement approach

"Where Are We Today?"
Assess the Present

"Where Do We Want To Go?"
Strategy Definition
Target Definition

Model the Future

"How Do We Get There?"
Plan the Transition

"Make It So!"
Implement the Change

Experience Feedback

Pilot Planning

Gap Analysis
We developed and followed a standard approach.

<table>
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<tr>
<th>Build</th>
<th>Deploy</th>
<th>Implement</th>
<th>Verify</th>
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<tr>
<td><strong>Commitment to Perform</strong>&lt;br&gt;Take actions to ensure that the processes are established and will endure.</td>
<td><strong>Ability to Perform</strong>&lt;br&gt;Establish preconditions that must exist in the project or organisation to implement the process competently.</td>
<td><strong>Directing Implementation</strong>&lt;br&gt;The direct day-to-day monitoring and controlling of the process.</td>
<td><strong>Verifying Implementation</strong>&lt;br&gt;Ensure activities are performed in compliance with the established process and policy.</td>
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<td>‣ Create policies and secure sponsorship.&lt;br&gt; ‣ Create processes and procedures based on existing leading-practice assets.&lt;br&gt; ‣ Review, confirm and approve processes and procedures.&lt;br&gt; ‣ Publish process assets.</td>
<td>‣ Gain commitment from key stakeholders.&lt;br&gt; ‣ Design, develop and deliver training to target audiences.&lt;br&gt; ‣ Define an organisation-wide adoption plan for new processes and procedures.</td>
<td>‣ Plan adoption activities to be performed by practitioners.&lt;br&gt; ‣ Review actual adoption performance versus plan.&lt;br&gt; ‣ Coach right behaviours and support practitioners in their adoption.</td>
<td>‣ Conduct Process Adherence Verification (PAV) reviews with projects and practitioners.&lt;br&gt; ‣ Conduct senior management reviews to evaluate process compliance.&lt;br&gt; ‣ Manage non-compliance issues to resolution.</td>
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Governance Structure

Management Steering Group
- Sponsor
- MSG Team Members

Transformation Program Manager

Software Engineering Process Group
- Process Methodology Team
  - Manager
  - Process Engineers
- Quality Assurance Team
  - Manager
  - QA Engineers
- Measurements Team
  - Manager
  - Measurement Team
- Tools Team
  - Manager
  - Tools Team

Working Teams, Process Improvement Projects or Action Owners
- Estimating
  - Process Team
- Metrics
  - Process Team
- Communication
  - Process Team
- Rational Tools
  - Process Engineers
  - Team Members
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- **Management System (Management Practice)**
  - Web Based – available to all staff
  - Contains policies, procedures, guidelines and templates
  - Provided a single entry point for both managers and technical staff

- **Global Services Method (Engineering Practice)**
  - Custom Application Development
  - Application Maintenance/Enhancement
  - Complex Systems Lifecycle
  - Rapid Solutions Development
  - Package Integration
Established approved tools list
  - Eliminated duplicate tools and extra costs

Consistent end to end tool suite

Rational Suite tools
  - Reference architecture based/standard development environment
Skills

- Strategy driven

- Certification paths
  - Project Management
  - Architecture
  - Specialists, e.g., Testing, DB2, Rational, Microsoft

- Balance between organisational needs and personal career aspiration
Organisation

- Review and clarify defined roles and responsibilities
- Aligned staff and projects against skill competencies
- Documents of understanding
- Standard management reporting framework
Establish external and internal ‘scorecard’

Retained only those measures that aligned to business objectives

Standardised and centralised measurement collection, storage and reporting

Consistent metric based management review meetings at all management levels
Culture

- Straight Talk communication
- Shared vision and teaming to delivery
- Prescriptive and consistent performance reviews
- IBM employee and manager training
- Personal change and how to manage change
Cultural considerations - Australia

- Organisational hierarchy is not important
- Expect to be consulted before major organisational decisions are made
- Performance measured on tangible results
- Individuals identify and solve problems
- Prefer radical change rather than incremental steps
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Lessons learnt - successes

- Senior Management Commitment - Strong Sponsorship and commitment
  - Link with business goals

- Manage process improvement as a project or program
  - Have a comprehensive deployment plan

- Communication to all teams (early and lots of it)
  - Constant regular communication - clear and concise
  - Multiple methods of making sure teams get messages (CMM Champions, mail)

- Well planned and regular “Health checks” of progress
  - Track actions resulting and ensure senior management focus

- Take up of changes with new work
  - No retro-fitting
  - Doing things where possible as “business as usual”
Lessons Learnt - Things to watch out for

➢ Education/Communication
   - Not too much at the one time, some things can’t be rushed
   - Keep it simple - use regular team meetings to disseminate message
   - Consistent and regular messages from senior management/sponsor

➢ Key practices
   - Ensuring teams understand the link between planning, executing, measuring, analysing, correcting, evaluating effectiveness
   - Make sure teams and Management know where they fit into to big picture and can explain this (roles and responsibilities)

➢ Tracking of progress
   - Clear milestones and exit criteria for teams
   - Closely tracked by project teams and line management, not internal group - ownership is with the teams
   - Consequences for non conformance
“Quality is never an accident; it is always the result of intelligent effort.”

John Ruskin (1819 - 1900)
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