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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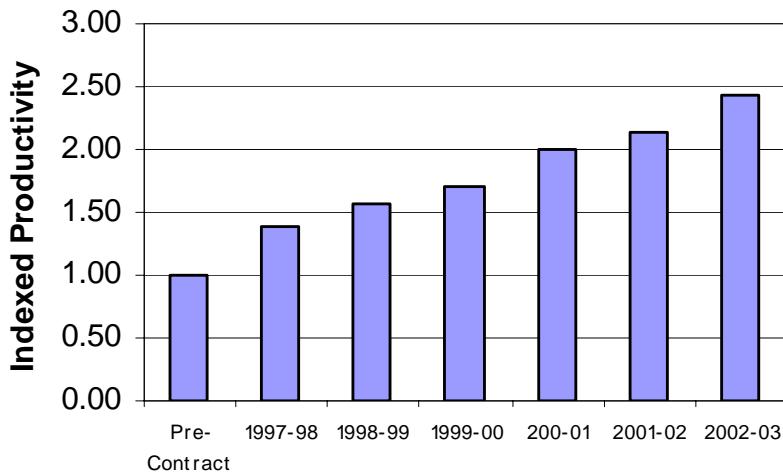
➢ The lessons learned

Account Financial Benefits

Cumulative Cost Savings
(compared with year 1 productivity)
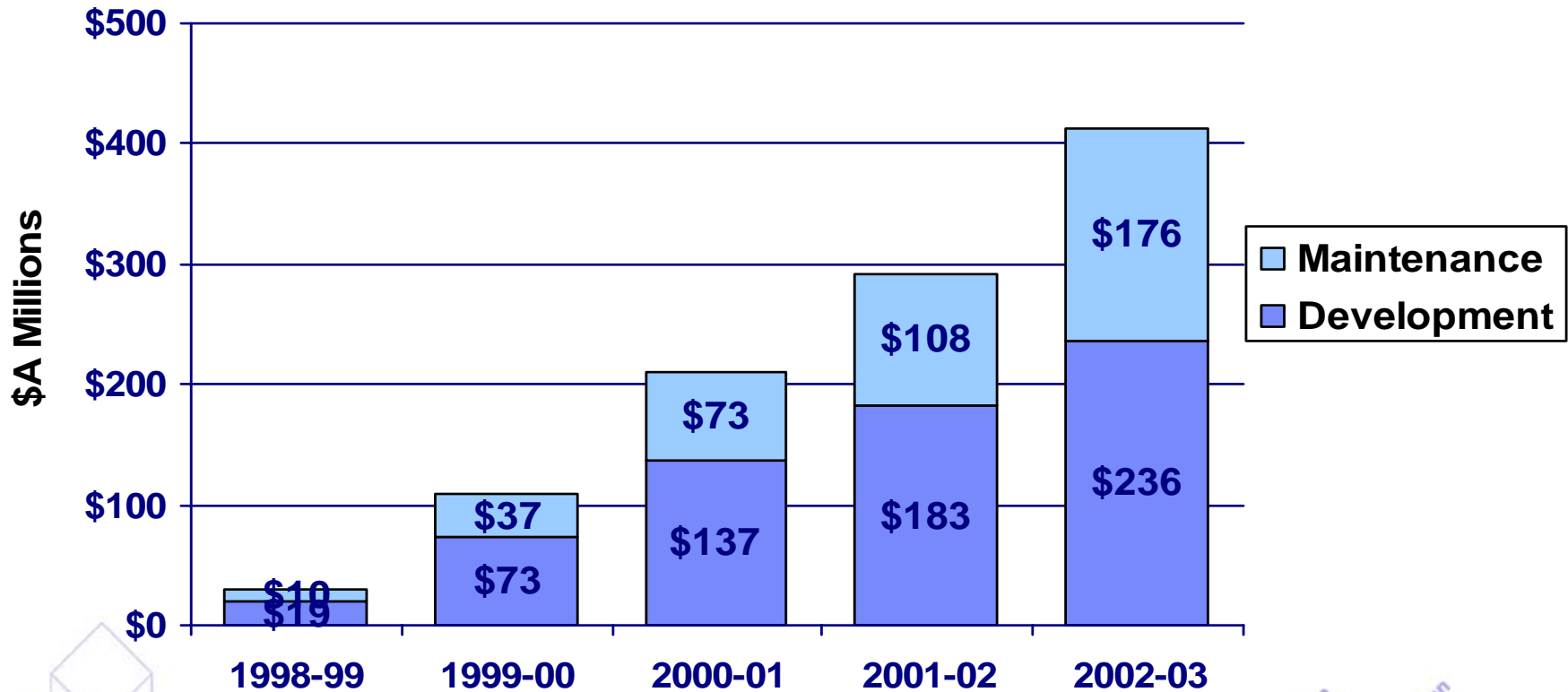
Account Achievements

- ➢ **145% improvement in productivity since outsourcing**
- ➢ **58% reduction in production problems & 94% reduction in severity 1 problems over the past 4 years**

Account Productivity (FP/FTE)

Indexed Productivity

Pre-Contract	1997-98	1998-99	1999-00	200-01	2001-02	2002-03
1.00	1.38	1.56	1.70	2.00	2.13	2.43

Account Production Problems

- ▇ Problems per 1,000 FPs maintained
- ◆ Sev 1 Problems per 1,000 FPs maintained

	1999-00	2000-01	2001-02	2002-03
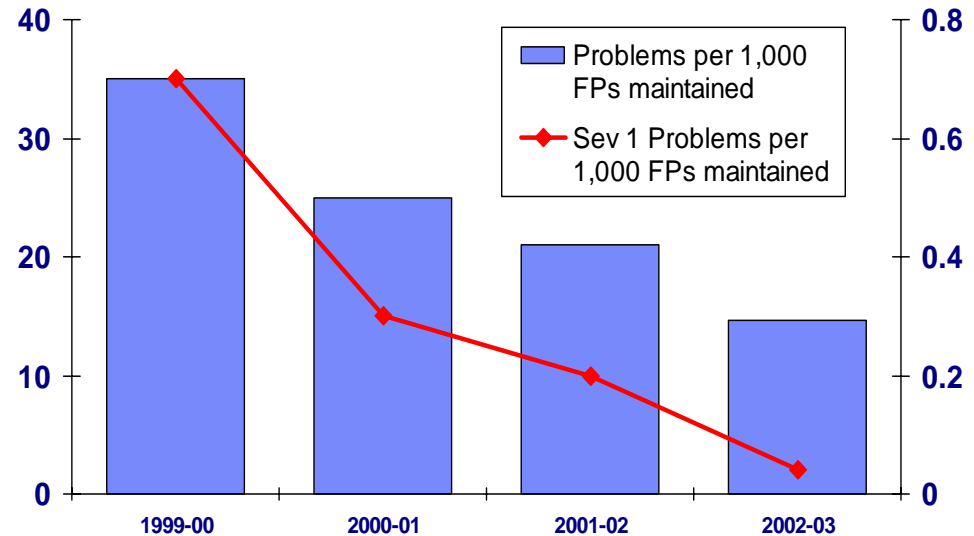
What about the employees?

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

- ➤ **Improved morale**
    - ❑ More stable work environment
    - ❑ Better balance of personal and profession 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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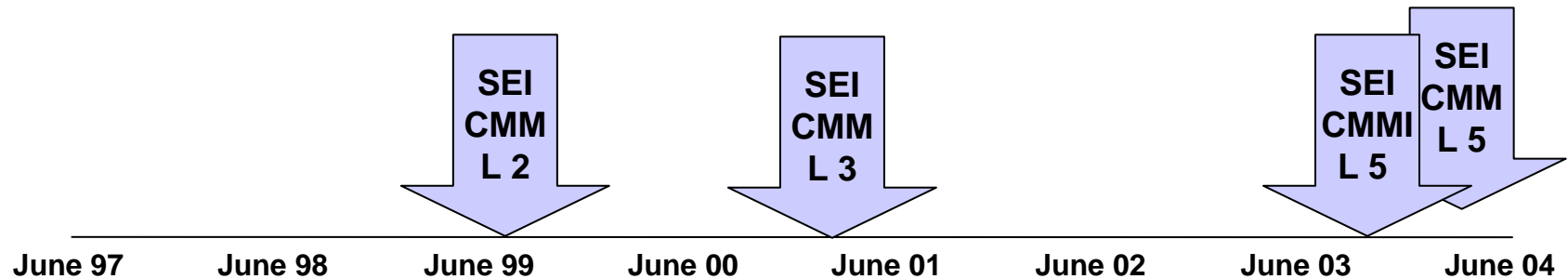
➢ **The lessons learned**

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

		SEI CMM L 2		SEI CMM L 3		SEI CMMI L 5	SEI CMM L 5
June 97	June 98	June 99	June 00	June 01	June 02	June 03	June 04

- 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

Award for Software Process Achievement, 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**
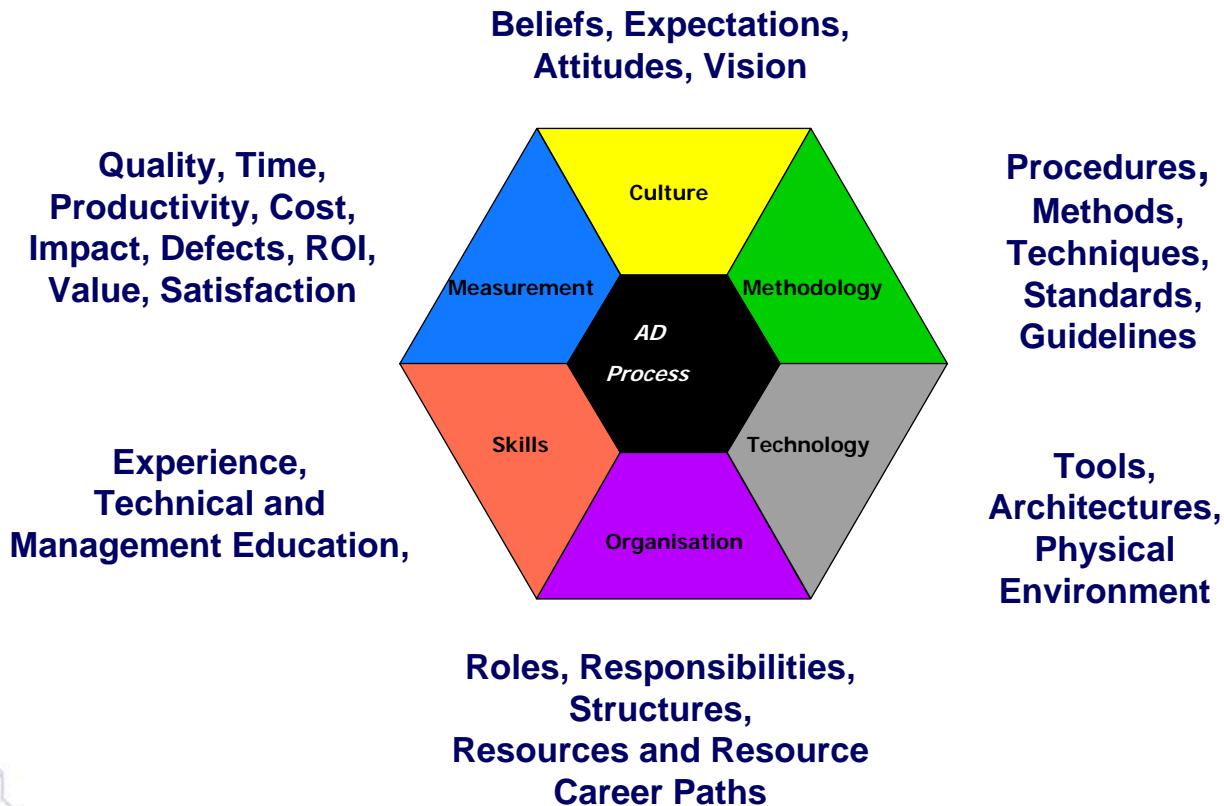
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The scope of process improvement

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

Procedures, Methods, Techniques, Standards, Guidelines

Culture

Measurement

Methodology

AD Process

Skills

Technology

Organisation

Experience, Technical and Management Education,

Tools, Architectures, Physical Environment

Roles, Responsibilities, Structures, Resources and Resource Career Paths

Our improvement approach

"Where Are We Today?"

Experience Feedback

Assess the Present

Strategy Definition
Target Definition

"Make It So!"

Implement the Change

Model the Future

"Where Do We Want To Go?"

Pilot Planning

Plan the Transition

Gap Analysis

"How Do We Get There?"

(Center hexagon: Culture, Methodology, AD Process, Technology, Organisation, Skills, Measurement)

We developed and followed a standard approach.

For Each Release

Build ▶

Commitment to Perform
Take actions to ensure that the processes are established and will endure.

- ▸ Create policies and secure sponsorship.
- ▸ Create processes and procedures based on existing leading-practice assets.
- ▸ Review, confirm and approve processes and procedures.
- ▸ Publish process assets.

Deploy ▶

Ability to Perform
Establish preconditions that must exist in the project or organisation to implement the process competently.

- ▸ Gain commitment from key stakeholders.
- ▸ Design, develop and deliver training to target audiences.
- ▸ Define an organisation-wide adoption plan for new processes and procedures.

Implement ▶

Directing Implementation
The direct day-to-day monitoring and controlling of the process.

- ▸ Plan adoption activities to be performed by practitioners.
- ▸ Review actual adoption performance versus plan.
- ▸ Coach right behaviours and support practitioners in their adoption.

Verify ▶

Verifying Implementation
Ensure activities are performed in compliance with the established process and policy.

- ▸ Conduct Process Adherence Verification (PAV) reviews with projects and practitioners.
- ▸ Conduct senior management reviews to evaluate process compliance.
- ▸ Manage non-compliance issues to resolution.

Governance Structure

Management Steering Group

| Sponsor | MSG Team Members |

Transformation Program Manager

Process Owners

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

| Manager | Process Engineers | Team Members |

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Methodology

➢ **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
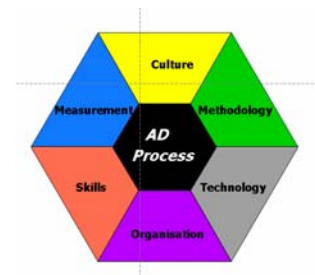
Technology

➤ **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, eg Testing,DB2, Rational, Microsoft**

- ➢ **Balance between organisational needs and personal career aspiration**
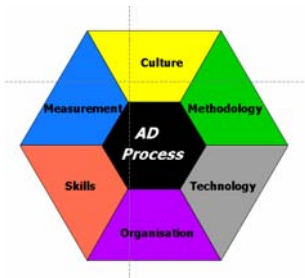
Organisation

- ➢ Review and clarify defined roles and responsibilities

- ➢ Aligned staff and projects against skill competencies

- ➢ Documents of understanding

- ➢ Standard management reporting framework

Measurement

➢ 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
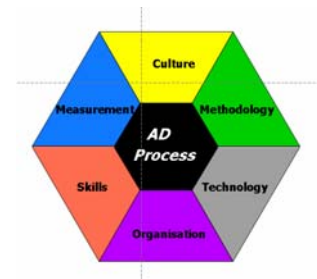
Culture

➢ **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

The quality of software…

"Quality is never an accident; it is always the result of intelligent effort."

John Ruskin (1819 - 1900)

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