



IBM Software Group

# CMMI and Process Improvement

*Tom Walton*

*Patrick Shelton*

**Rational** software



@business on demand.

# Agenda

- Case Studies
- Where IBM Rational Can Help
- Process Improvement Implementation
- Compliance



# Software Process Improvement ROI

- The Return on Investment (ROI) of software process improvement projects is impressive:
  - ▶ 35% average gain in productivity
  - ▶ 39% average decrease in post-release defects
  - ▶ 5:1 average ROI
- This return can clearly be enhanced through the use of an integrated best practice/process/automation tool suite such as IBM Rational Suite

Source: CMU/SEI-94-TR-013 Benefits of CMM-Based Software Process Improvement: Initial Results, Software Engineering Institute



## Client Quote

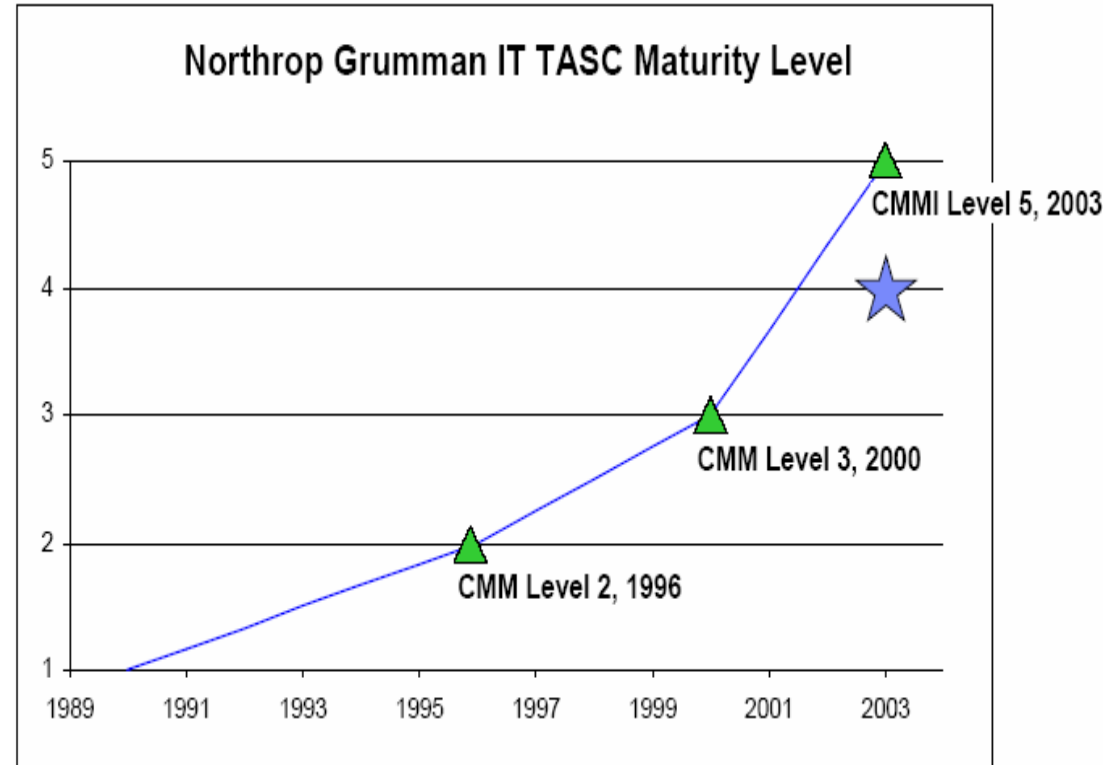
“Recently, we received CMM level 3 from the SEI organization out of Carnegie Mellon University. We use the Rational Suite of tools to help us enforce the use of processes necessary to reach this level. Rational has developed a suite of tools that permits you to follow the CMM processes and document the necessary information. It will help you along the way to enforce the processes and make sure that everyone does requirements management and change management all in the same manner. The Rational Suite of tools brings a great value to our software development”

Claude Mercier, Lockheed Martin Canada



# Northrop Grumman Information Technology

- Rational client since 1994
  - ▶ Rose, ClearQuest, ClearCase, RequisitePro
- Three week formal assessment
  - ▶ Two divisions participated, four projects
- Used Staged Representation



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# Symptoms of Process Failure

## **Commitments consistently missed**

- Late delivery
- Last minute crunches
- Spiraling costs

## **No management visibility into progress**

- You're always being surprised

## **Quality problems**

- Too much rework
- Functions do not work correctly
- Customer complaints after delivery

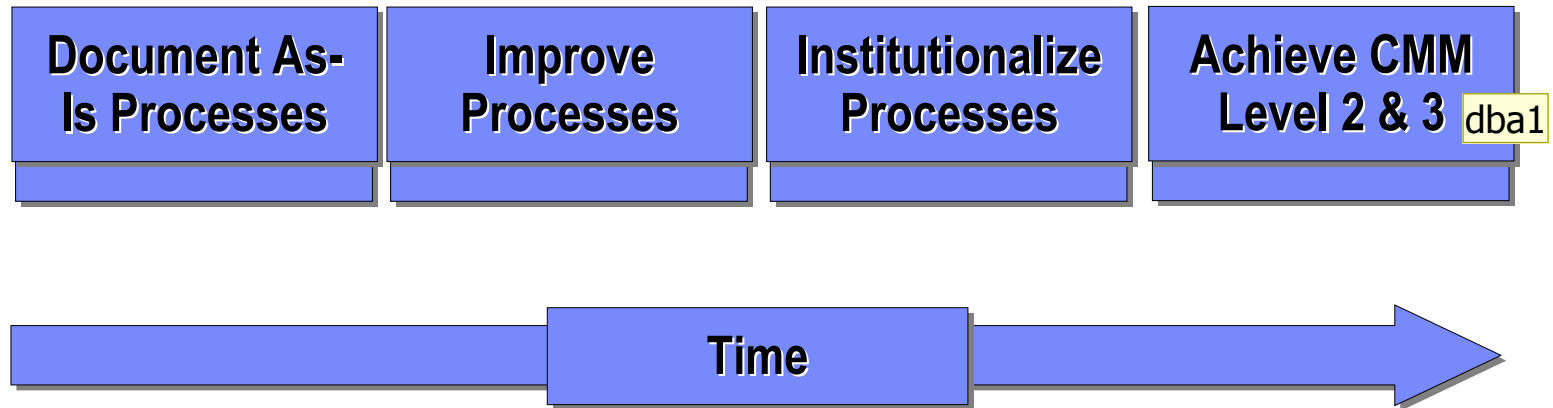
## **Poor morale**

- People frustrated
- Is anyone in charge?



# CMMI Acceleration

- Use of the Rational Unified Process, best practices, and Rational automation tools accelerates the achievement of CMMI Level 2 & 3





**dba1**

CMM Level 2 or 3. Yes?

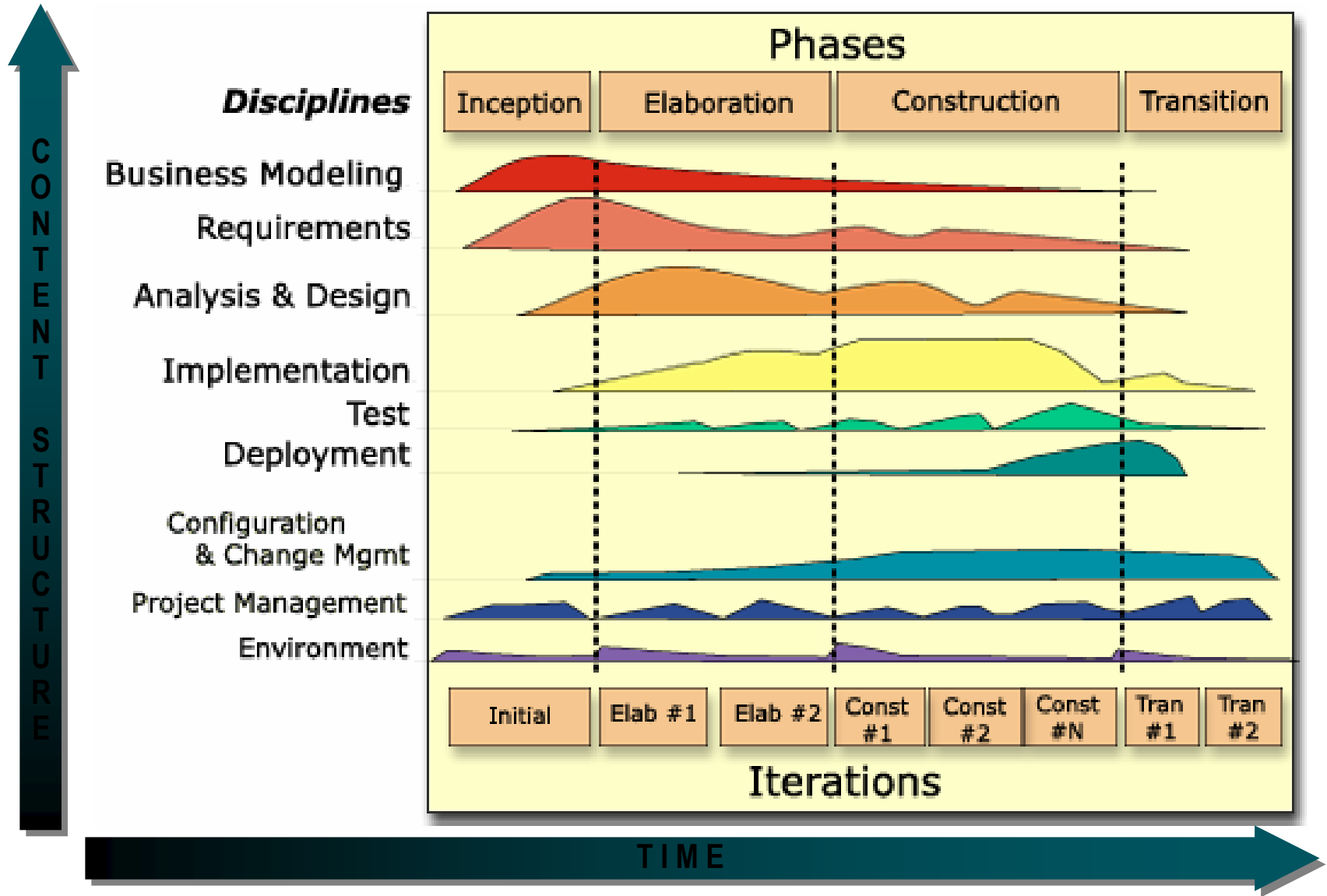
dalvey, 26-Nov-04

# The Rational Unified Process: A Framework for Improving Software Development Effectiveness

- Can be tailored/right-sized to balance management and technical perspectives
- Supports collaboration throughout the lifecycle
- Provides guidance on how to measure and control development through iterative methods
- Provides best practices on the effective use of the supporting infrastructure

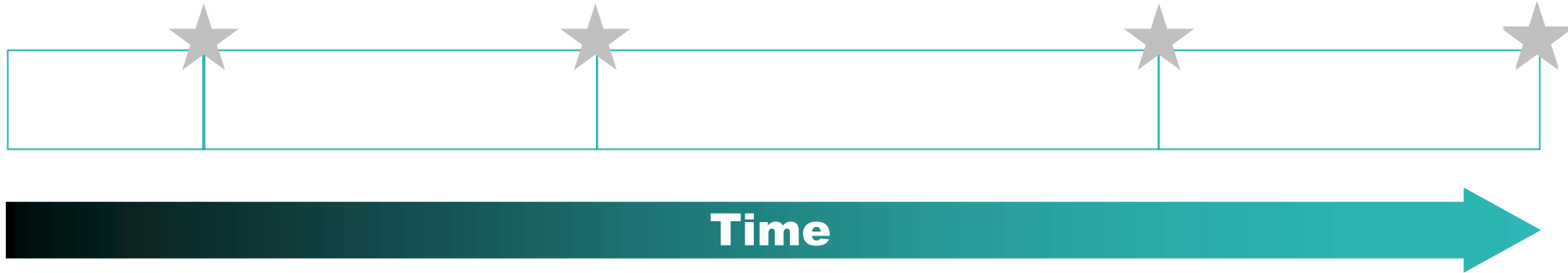


# Two Dimensions to the RUP



# The RUP Project Management Framework

## Phases



Inception: Mitigate “Business” Risks; gain agreement on overall scope

- ▶ Vision, high-level requirements, business case
- ▶ Not detailed requirements

Elaboration: Mitigate “Technical” Risks; agreement on solution approach

- ▶ Baseline architecture, most requirements detailed
- ▶ Not detailed design

Construction: Mitigate “Logistical” Risks; apply approach

- ▶ Working product, system test complete

Transition: Mitigate “Deployment” Risks; roll-out solution into “production”

- ▶ Stakeholder acceptance



## Rational Solutions Support for Level Two

Process Area	Rational Solutions
Requirements Management	RequisitePro, RAD/RSA, RUP
Project Planning	Portfolio Manager, ProjectConsole, ClearQuest, RUP
Project Monitoring and Control	Portfolio Manager, ProjectConsole, ClearQuest, Test Manager
Supplier Agreement Management	RequisitePro, RUP + COTS Plug-in,
Measurement and Analysis	RUP, ProjectConsole, ClearQuest, RequisitePro
Process and Product Quality Assurance	RUP, ClearQuest, RequisitePro, Test Manager, Functional Tester
Configuration Management	ClearCase, ClearQuest, UCM



## Rational Solutions for Level Three

Process Area	Rational Solutions
Requirements Development	RUP, RequisitePro, RSM
Technical Solution	RUP, RSA/RSD, ClearCase
Product Integration	RUP, RSA/RSD, ClearCase, ClearQuest
Verification	RUP, TestManager, Purify
Validation	RUP, RequisitePro, ClearQuest, TestManager
Organizational Process Focus	RUP, RUP Builder/RMC, ClearQuest, RequisitePro
Organizational Process Definition	RUP, Process Workbench/RMC



## Rational Solutions for Level Three

Process Area	Rational Solutions
Organizational Training	RUP, Rational Services, Rational University
Integrated Project Management	RUP, RequisitePro, ClearCase, ClearQuest, ProjectConsole
Integrated Teaming	RUP, RequisitePro, ClearCase, ClearQuest, ProjectConsole
Decision Analysis and Resolution	RUP, RequisitePro, ClearQuest
Risk Management	RUP, ClearQuest, RequisitePro, SoDA
Organizational Environment for Integration	RUP, RequisitePro, ClearCase, ClearQuest, ProjectConsole



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## Implementing Automated Solutions in a CMMI Environment

- Interacting with the Software Engineering Process Group (SEPG)
- Selecting what tools to implement and when to implement
- Participating in the Assessment
- CMMI and Iterative Development



## Probable Positive Forces of CMMI Environments

- Acknowledgement of performance or capability issues
- The recognition of the role of good process
- “Culture of Improvement”



## Potential Challenges in CMMI Environments

- Process Improvement versus Capability Improvement
- Combating the “Process Definition + Training = Process Adoption” Fallacy
- Too much focus on obtaining the certification NOT intrinsic improvement of the certification
- Forgetting Improvement Motivators
- Documentation, Documentation, Documentation



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# IBM SWG Solutions for Regulatory Compliance

## Business Controls Automation



CFO

**Business Controls & Reporting**

**Workplace Business Controls and Reporting**  
Rational Requirements Management, WebSphere Business Process Modeling and Monitoring

**IT Governance**

**IBM Workplace for Business Strategy Execution, Rational Portfolio Management, Tivoli Business Systems and Service Level Management**

**BDD for Compliance**

*Enforce software development business controls*

**Rational Requirements Management / Change Management / Portfolio Management**

**Security/ Identity**

*Ensure system security*

Tivoli Identity, Security, Monitoring

**Information Management**

*Manage data privacy, access, and integration*

DB2 Content / Storage / Records Management, WebSphere Business Intelligence / Integration



CIO

## IT Controls Automation



# Business-Driven Development for Compliance: *Three dimensions*

1

## ***WHAT you build***

IBM Rational RequisitePro  
IBM Rational Manual Tester

- *Lifecycle traceability*  
Requirements through test results
- *Continuous validation*  
***Documents: Applications meet compliance mandates***

2

## ***HOW you build it***

IBM ClearCase and ClearQuest

- *Auditable workflows*
- *Verifiable builds*  
***Documents: An audit-ready development infrastructure***

3

## ***HOW you manage it***

IBM Rational Portfolio Manager

- *Compliance project tracking*
- *Metrics with drill-down analytics*  
***Documents: Effective IT oversight***





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# Thank You

**Rational** software



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