



IBM Software Group

# CMMI and Process Improvement

*Tom Walton*

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**Rational.** software



@business on demand.

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## 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

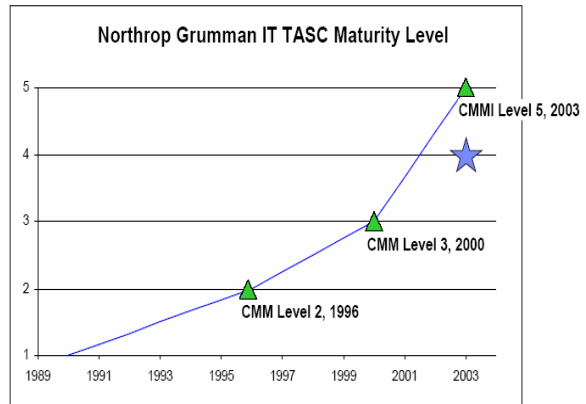
“Recently, we received CMM level 3 from the SEI organization out of Carnegie Mellon University. We use the Rational Suite of tools to help us enforce the use of processes necessary to reach this level. Rational has developed a suite of tools that permits you to follow the CMM processes and document the 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

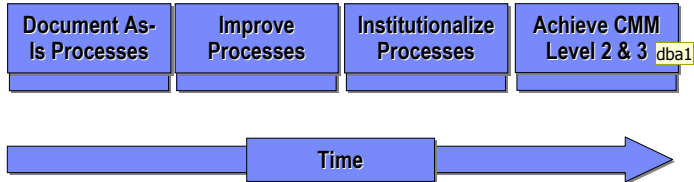
### **Poor morale**

- 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





## Slide 8

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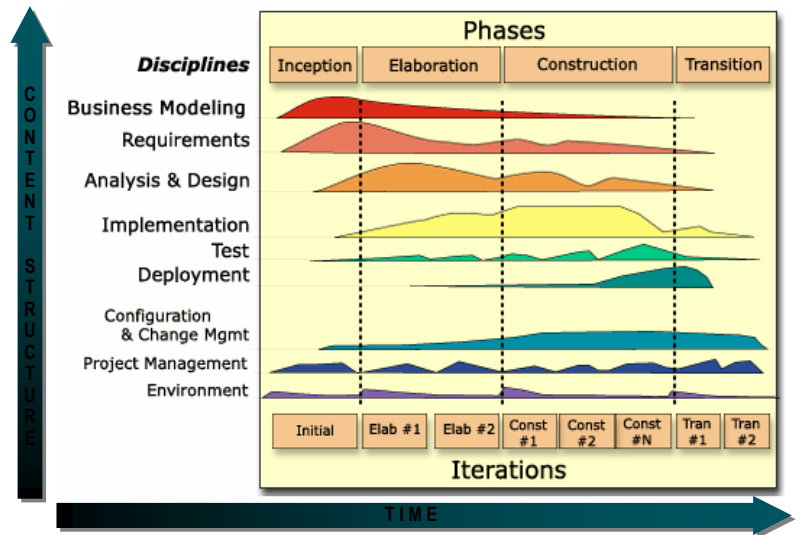
**dba1** CMM Level 2 or 3. Yes?  
dalvey, 26-Nov-04

## 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

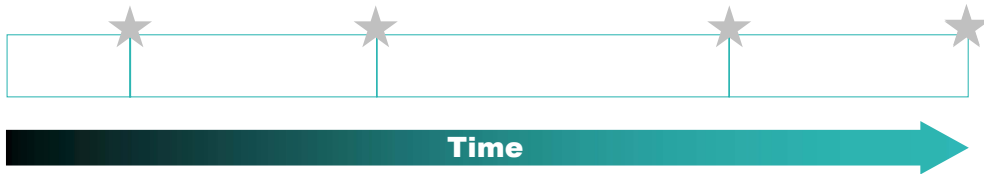


A given iteration includes multiple workflows. The form the workflow will take varies, depending on its position within the overall lifecycle, and the nature of the project.

Notice that the disciplines correspond very well with the Key Practice areas in CMMI 2/3. We will explore this in more detail in a subsequent section.

# 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

When implementing a Rational solution within an organization that is implementing CMMI, it will be necessary to work with the Software Engineering Process Group. Frequently, in large enterprises this is a centralized, group that “owns” the processes and standards.

## 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

Many CMMI practitioners place too much emphasis on defining and documenting a process for the organization and not enough time planning and ensuring the actual adoption of the process. This is counter to the approach Rational of Adoption Through Execution.

In reviewing a couple of books on CMMI the question of “Why CMMI” was often posed. The answer too frequently were things like... to reduce the cost of multiple process improvement frameworks, stay on top of the latest models, etc. and NOT a general focus on results that the business needs to deliver.

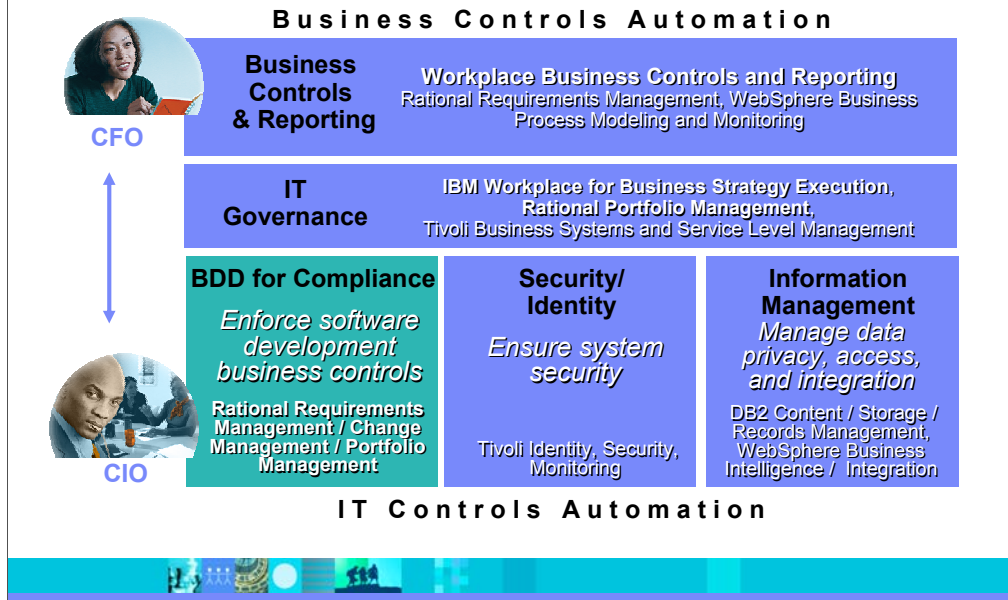
Quotes such as this, “By providing to our programs the required artifact template. Programs through executing the artifact templates are CMMI compliant” are reasons for concern.

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## IBM SWG Solutions for Regulatory Compliance



IBM SWG landscape for Compliance solutions >> Modular solutions for reducing the cost of compliance through automation!

Business Controls and Reporting + self audit solns

- CFO level

- Business control repository and audit reporting

- Lotus WBCR fits here, complimented by Rational Reqmts Mgmt and WS Business modeling

IT Governance solns

- RPM complimented by some Tivoli products

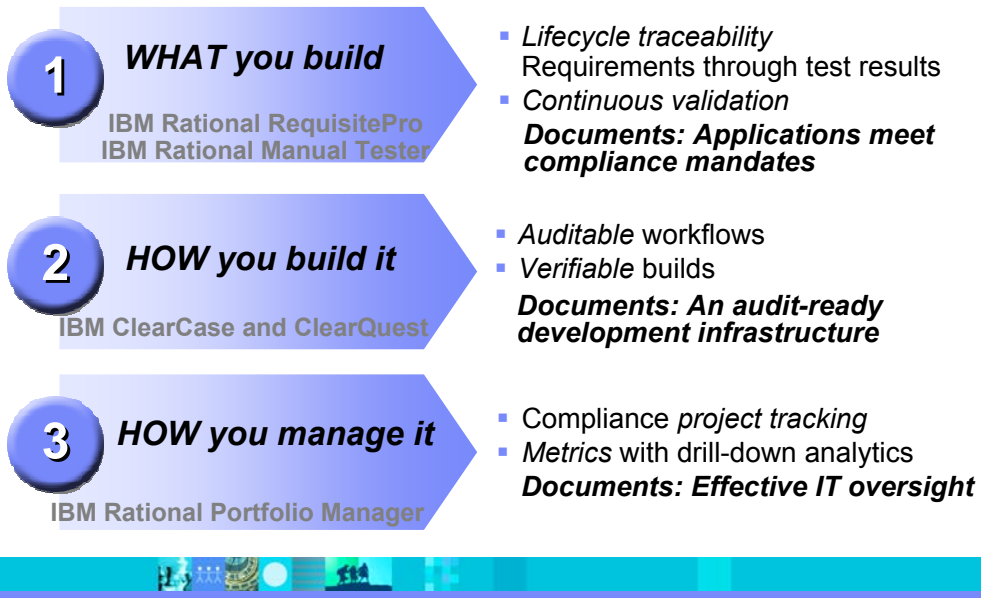
IT Applications solns

- Software Development > Rational compliance soln for an audit-ready development infrastructure

- Implementing Security/Identity reqmts > Rational SDP and Tivoli

- Information Mgmt > DB2 and WS solutions for data privacy access and integration

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



Who did WHAT, WHEN and WHY

1. WHAT you Build – this is our traceability story; lifecycle traceability all the way from requirements out to deployment; we provide the ability to “document” that key applications meet specific compliance mandates; Rational RequisitePro is our primary offering here and also ably supported by our testing tools
2. HOW you Build it – this is our good hygiene story; it’s all about providing an “audit-ready” development infrastructure that includes auditable workflows and verifiable software builds; who did what, authorized by whom and when; Rational ClearCase/ClearQuest are our primary offerings here
3. HOW you Manage it – this is our IT oversight story; audit reports, compliance project tracking, metrics; all to enable effective IT oversight of the customer’s compliance mandates; Rational Portfolio Mgr is our primary offering here

So Compliance is all about being able to **prove** what you say you are doing to comply with particular regulations - and this typically means being able to show documentation/documentation/documentation that proves it!



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Thank You

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