Welcome!

Requirements Engineering and Model Driven Development
…driving Innovation and Agility in Modern Systems Development

Smart Products
Requirements Engineering and Model Driven Development
...driving Innovation and Agility in Modern Systems development

Agenda

9:30 AM   Registration
10:00 AM  Welcome, Introductions, and Overview of the IBM Systems Solution  Chuck Hilger
10:30 AM  Introduction Requirements Engineering and DOORS  Nancy Rundlet
11:00 AM  What’s New in DOORS and DOORS Futures
11:00 AM  Demonstration of DOORS and DOORS Web Access  Justin Mulhearn
11:30 AM  Customer Presentation: Requirements Engineering Best Practices  Mark Smedley

12:00 PM  Lunch
12:15 PM  Working lunch:
  Simplifying Reporting: Rational Publishing Engine Overview  Justin Mulhearn

1:00 PM   Introduction to Model Driven Development and Rhapsody  Tim Thorpe
1:30 PM   Demonstration of Rhapsody  Gavin Arthurs
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2:30 PM   Closing Remarks  Chuck Hilger
How does IBM Rational map into the generic “V” cycle

- **Requirements Mgt:** DOORS
- **System Integration, Test & Calibration**
- **Deployment**
- **Best Practice and Process Repository:** Method Composer
- **Configuration Management:** Rational Team Concert, ClearCase, Synergy
- **Change Management:** ClearQuest, Change
- **Iterative Development**
- **Subsystem Integration, Test & Verification Regression Testing**
- **System Integration, Test & Calibration**
- **Subsystem Integration, Test & Verification Regression Testing**
- **Testing:** Rational Quality Manager
- **Modeling:** Rhapsody
- **SW-Implement. Level**
- **Technology Level**
- **Build Mgt:** BuildForge
- **SW-development & Implementation & Component Test**
- **Build Mgt:** BuildForge
- **Testing:** Rational Quality Manager
- **Modeling:** Rhapsody
- **Technology Level**
- **SW-Implement. Level**
- **Sub-System / Component Level**
- **System Level**

**Logical / Functional Architecture & Design**

**Physical System Architecture & Design / Partitioning**

**Subsystem Requirements**

**System Requirements**

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We are ushering in a new wave of innovation

Driven by*
1. New & emerging technologies
2. Genuine market need and economic viability

Smarter Products
- Instrumented, interconnected, and intelligent
- Building blocks for a smarter planet
- Sustainability

It is just a matter of time… everything will be connected to everything!
Products are getting **smarter** to meet more demanding and unique needs of customers.

By 2010, there will be a billion transistors per human, each costing one ten-millionth of a cent. The technology is being embedded into billions of devices – cars, appliances, roadways, etc.

By 2011, an estimated 2 billion people will be on the Web – connected to devices in an unprecedented way.

90% of innovation in modern cars is based on electronics; 80% of this is based on embedded software.
Many industries already have seen this software shift. In aerospace and defense, software content has increased 10X.
The Innovation Agenda: Something meaningful is happening.....

Our world is becoming **INSTRUMENTED**
The ability to measure, sense and see the surrounding environment

Our world is becoming **INTERCONNECTED**
Enable communication and interaction between people, systems and other products in entirely new ways

All things are becoming **INTELLIGENT**
Respond to changes quickly and accurately, and improve efficiency and effectiveness by predicting and optimizing for future events

**SMALLER. FLATTER. SMARTER.**

Resulting in transformational change across all industries

Energy  Traffic  Offices  Retail  Telecom  Food  Banking  Healthcare
The Product Development Landscape is Evolving

From Focusing on Cost - to Focusing on Innovation

**Business Drivers**

**1970 - 1980**
- Productivity improvement through automation

**1980 - Present**
- New technology for reduced cost & time, increased flexibility

**Present & Beyond**
- Globalization of suppliers, workforce & markets

### Product Development

- 2D CAD
- Ad-hoc data management
- No organization / process change

- 3D CAD
- PDM focus on mechanical BOM
- Organization & process improvement

- Increased focus on software engineering
- Full traceability of requirements throughout product lifecycle
- Holistic system design and interaction

### Business Value

- Improved production with higher quality
- Time and cost reduction
- Rapid innovation with software as major differentiator
Over 75 percent of CEOs indicated that collaboration and partnering is very important to innovation.

Extensive collaborators outperformed the competition in terms of both revenue growth and average operating margin.

CEOs stressed the overwhelming importance of collaborative innovation – particularly beyond company walls.

Source: IBM Global CEO Study, 2006
Problems with the traditional disconnected ‘V’

- In the traditional V, work is serial, and team members are disconnected and often waiting on the work of others, leading to delays.
- Artifacts handed off from the previous process step are informal and not tested, leading to poor quality.

- Project managers are unable to accurately assess progress of their development teams, and are unable to respond quickly to change.
What does it take to fundamentally transform systems & software delivery?
We asked ourselves: “What if …”

<table>
<thead>
<tr>
<th>The silos became transparent…</th>
<th>✓</th>
<th>Enabling you to <strong>report</strong> on and manage projects with dashboards spanning teams and repositories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streamlining delivery is possible…</td>
<td>✓</td>
<td>When teams <strong>automate</strong> tasks and processes, scan for errors, and re-use assets</td>
</tr>
<tr>
<td>Teams learned from each other…</td>
<td>✓</td>
<td>Because they can <strong>collaborate</strong> across teams, geographies, and organizational boundaries</td>
</tr>
<tr>
<td>The web inspired the solution …</td>
<td>✓</td>
<td>Allowing users to <strong>navigate</strong> the ALM web of artifacts using a consistent UI framework</td>
</tr>
<tr>
<td>Heterogeneous environments…</td>
<td>✓</td>
<td><strong>Integrate</strong> with an open and flexible approach, reducing the total cost of ownership</td>
</tr>
</tbody>
</table>
Focus on breaking down the barriers across the lifecycle

- Spans the entire systems and software lifecycle
- Integrates complex systems, embedded software and IT to create innovative products
- Achieve end-to-end traceability
- Providing proof of compliance
Drive Iterative Systems development

*breaking up a complex problem into smaller pieces*

- With Rational Team Concert as the collaboration hub, teams can iteratively define the system’s functional behavior and architecture.
- Requirements captured in DOORS are further elaborated with each iteration, as leaf requirements are defined and allocated to an evolving architecture.
- With each iteration, Rhapsody enables verification of system requirements through model execution.

![Diagram of Iterative Systems development process](image)
Integrate Software, Electronic, and Mechanical Domains

- Best practices for measured improvement
- Integrated software, electronic and mechanical
- Market leading and proven products

- Rich set of modular, easy to adopt tools
- Non-proprietary, open platform
- Broad Lifecycle coverage
The Result – Jazz, an Open and Extensible Systems and Software Development Platform

Jazz is...
A scalable, extensible team collaboration platform
A community at Jazz.net where you can see Jazz-based products being built
Our vision of the future of systems and software delivery, supporting globally distributed teams
An integration architecture enabling mashups and non-Jazz based products to participate
An evolution of our portfolio which will evolve to leverage Jazz technology over time
With Rational customers can break down organizational, functional and geographic barriers thru collaboration, automation and reporting.

Real-time, transparent access to project data, risks and progress.

Integrated, loosely coupled Logic, User Interfaces Data Models, Workflow Administration.
Project Icarus, the original $150 near-space launch!

http://space.1337arts.com

Modern Icarus took off with the right stuff
MIT students snapped the earth from space with a simple camera
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Summarize Rational value proposition:

1) Breakdown silos across the V lifecycle
2) Create a collaborative and iterative environment across the Development Disciplines
3) Verify Requirements with Modeling early in the process
4) Automate development from High Level User requirements to code generation via Rhapsody Modeling (SysML and UML)
5) Reduce “cost of test” by implementing model execution early in the process
6) Bring Web services and Internet Technologies into the Development Environment (Open Services Lifecycle Collaboration jazz.net)
7) Expand Requirements Management and Change Management from the SW Domain into the Electronics and Mechanical Domains
Possible next steps

- View resources from ibm.com (will send links in follow up email)
- Follow IBM Rational development on Jazz.net
- Attend or view the “Day in the Life of a Systems Project” webcast (will review in more detail on next slide)
- Schedule lunch and learn session's for your organization
- Contact us for workshop ideas:
  - Eliciting effective Requirements
  - Writing effective Requirements
  - Reporting and Publishing
  - Model Based Systems Engineering Best Practices (Harmony for Systems Engineering)
  - Model Driven Embedded SW development and Autocode generation (Harmony for Embedded SW Dev.)
  - Reducing Cost of Test
  - Multicore development
  - Simulink and Rhapsody Integration
  - Product Line Engineering (managing version and variance)
  - Change Management
  - SW, HW, Mech Requirements Management and Change Management
- Investigate merits of a process assessment followed by a POT (proof of Technology)
- Process Metrics discussion
Webcast Series:
“Day in the Life” of a Systems and Software Project

June 17th, 2010  1:00 PM  EDT
Requirements Engineering

June 29th, 2010  1:00 PM  EDT
Model Based Systems Engineering

July 8th, 2010  1:00 PM  EDT
Model Driven Software Development

July 22nd, 2010  1:00 PM  EDT
Quality and Test Management

For questions or more information contact:
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Thank You

Learn more at:
- IBM Rational software
- Rational launch announcements
- Rational Software Delivery Platform
- Accelerate change & delivery
- Deliver enduring quality
- Enable enterprise modernization
- Ensure Web security & compliance
- Improve project success
- Manage architecture
- Manage evolving requirements
- Small & midsized business
- Targeted solutions
- Rational trial downloads
- developerWorks Rational
- Leading Innovation
- IBM Rational TV
- IBM Business Partners
- IBM Rational Case Studies

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