Continuous Engineering Solution
Vision & Strategy

Christophe Telep
*Product Manager, IBM*
Different Worlds Coming Together

Business IT Applications

Application Lifecycle Management
IT Operations Management

Embedded Systems

Systems Engineering
Product Lifecycle Management

New Business Opportunities
Different Worlds Coming Together

Business IT Applications

Application Lifecycle Management
IT Operations Management

Embedded Systems

New Business Opportunities

New Needs

Systems Engineering
Product Lifecycle Management
New Needs to capture New Business Opportunities

- Heightened focus on customer experience
  - Empower Agile Development Teams
  - Continuous Verification & Validation
  - Closing the feedback loop – Design for Analytics
  - Track progress and report on compliance
  - Unlocking insights – From Prescribed to Cognitive
- Lean and Agile at scale
- Accelerate delivery through Strategic Reuse
- Integrated and extensible development platform
Requirements are the starting point to everything

- Satisfy customer needs
- Deliver value to business
- Deliver projects on-time
- Comply with safety and industry regulations
- Promotes communication/collaboration
- Reduces risk of project failure

"Analysts report that as many as 71 percent of software projects that fail do so because of poor requirements management, making it the single biggest reason for project failure"

--- CIO Magazine
The DOORS family
Requirements Management across all project methodologies

- **DOORS Next Generation** extending collaboration
  *Previously known as Rational Requirements Composer (RRC)*
  - Focus on ease of use and adoption
  - New free form diagram editor
  - Round trip import/export CSV
  - Incremental DOORS migration automation

- Many of you will rely on the **DOORS 9.x** products for many years
  - Proven in complex and highly regulated environments
  - Enhanced to support adoption of iterative and agile
  - Improvements planned for many years to support your use on long standing projects

**DOORS Next Generation**
The next generation RM solution offering reuse, collaboration & open ecosystem, extending proven DOORS techniques, built on the Rational Jazz platform

**DOORS + DWA**
The trusted, de-facto standard RM tool for employing Systems Engineering methodologies to build complex and embedded systems

DNG v6.0.2
June 2016
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Work together, work smarter …

Work on the right things – Collaborative Planning
- Out-of-the-box templates for agile and waterfall workflows
- Plans linked to development
- Fast, task based UI for developers to speed agile adoption

Bring the team together – Collaborative Development
- Linked work, enables teams to find, fix and test things faster than using isolated, disjoint tools with brittle integrations
- Activity feeds, make work transparent across teams
- Easy reporting: Not manually cobbling bad data from multiple tools

Make work reliable and repeatable - Continuous Improvement
- Adapt process on the fly as part of continuous feedback
- Automate continuous integration to manage complexity
- Learn, Adapt, Reflect, Change
IBM Rational Team Concert - QuickPlanner

"As an agile team, we need to rapidly plan multiple sprints"

Swim lanes can be pinned to scroll sprints underneath the backlog

Easily drag and drop from your backlog to any sprint
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Continuous Verification & Validation

- **Verification**: Building the system right
  - Testing early on to lower cost and risks
  - Avoid big bang integration
  - Assuring compliance with regulations

- **Validation**: Building the right system
  - Customer needs are imprecise and incomplete as expected
  - Check early and often if system meets actual customer needs

- Reduces both Technical and Business risks.
  - Compresses time to customer feedback
  - Allowing for changes while reducing surprises
IBM Rational Quality Manager
**Agile Testing and Quality Management**

- Requirement driven-testing with traceability
- Agile Test Planning
- **Flexible Manual Testing**
  - online and offline
- Test case, script reuse
- Drive test automation tools
  - out-the-box integrations
  - Command line or APIs
- Team collaboration
- Reporting and Analytics
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Learn and innovate faster with an IoT feedback loop

1. Define requirements, failure mode effects, KPIs and monitors
2. Implement monitors and test them using simulated devices
3. Collect operational data from installed systems
4. Use an engineering feedback loop to find the root cause of issues and improve the system design

Generate data

Cognitive insight

IoT-enabled products/systems

Design, Implement

Analyze, Inform

Powered by IBM Watson
IBM Rational Rhapsody & Design Manager
Development for Complex Systems & Software

- Requirements-driven **analysis and design** for technical, embedded or real-time solutions
- Rapid **design validation and verification** with frequent simulation and testing
  - UML 2.x, SysML, …
- Development and deployment of **complete** software
  - C, C++, Java and Ada

Rhapsody v8.1.5
DM v6.0.2
June 2016
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Self-service Reporting with Jazz Reporting Service

• Enterprise Reporting
  • Measure program, project, and team-level progress
  • Consistent metrics across an organization
• Agile & DevOps out-of-the-box reports
  • Burn-down & Burn-up reports
• Report & Dashboard elements that are easily created by anyone
• Calculated Roll-up & Report drill-through
• Traceability reports across domains and projects/teams
• Export to Excel, Rational Publishing Engine, Image
IBM Rational Publishing Engine

- Flexible Document generation
- Custom report design templates
- Multiple data sources
- Multiple output formats

- Drag & Drop for quick template design
- Simplified CLM traceability
- Word Import to start template creation
- Java Script Reuse across template

RPE v2.1
March 2016
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Unlocking insights – From Prescribed to Cognitive
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Unlocking Engineering Insights with IBM Rational Engineering Lifecycle Manager

- Uniting engineering teams through:
  - Visibility – across many engineering disciplines
  - Organization – of information in context
  - Analysis – to answer lifecycle engineering questions

- Helps product development teams to:
  - Find the right information when it’s needed
  - Understand and react to change quickly
  - Gain actionable insights from engineering data
  - Co-ordinate strategic re-use

- A Linked Data approach means no disruption to current engineering environments
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Lean and Agile at scale
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Different Worlds Coming Together: **Lean & Agile at Scale**

*Balance efficiency and effectiveness to deliver the right things right!*

- Are we moving as fast as possible?
- Are we moving in the right direction?

**Efficiency**
- Eliminate waste
- Empower teams
- Continuous Improvement

**Effectiveness**
- End user focus
- Rapid Iteration
- Continuous feedback

**Balance**

Efficiency and Effectiveness to deliver the right things right!
Be Lean: Eliminate waste, focus on client value

- **Lean Manufacturing**
  - 20th Century, Henry Ford, Toyota Production System
  - Eliminate waste: material waste and doing job inefficiently out of habit
  - Type of waste: transport, inventory, motion, waiting, overproduction, over processing, defects

- **Lean Systems Engineering**
  - 1992 Lean Aerospace Initiative Consortium started at MIT
  - LSE working group at INCOSE - http://www.lean-systems-engineering.org

- **Lean Thinking**
  - Identify “Value” to customer and “Value Stream” that produces that “Value”

- **Lean Startup**
  - 2011 Book “The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses” by Eric Ries
  - Minimum Viable Product, Continuous Deployment, Build-Measure-Learn
Be Agile: Rapid iteration with continuous feedback

- **Agile Software Development**
  - 2001 “Manifesto for Agile Software Development” published on the Internet
  - Working software delivered early, frequently and continuously, frequent user feedback, welcome changing requirements, self-organizing teams that regularly reflects to improve
  - User Story, Backlog, Scrum, Continuous Integration, Retrospective …

- **DevOps**
  - Agile 2008 Toronto Conference: Agile Infrastructure and Operations Presentation
  - Foster collaboration between Development, QA and IT operations
  - Enables teams to release applications faster in production in a reliable manner

- **Scaling Agile to the Enterprise**
  - Apply agile methods to team of teams, up to portfolio level
  - Existing frameworks: Scrums of scrums, DaD, LeSS, SAFe, …
CLM supports Agile and Lean Systems Engineering at Scale

- Out-of-the-box templates
- Get up and running quickly
- Simplify change to culture and process
- Improve agility and predictability
- Measure, report, learn, improve

IBM Rational Collaborative Lifecycle Management (CLM)
- IBM Rational Team Concert (RTC)
- IBM Rational Quality Manager (RQM)
- IBM Rational DOORS Next Generation (DNG)

CLM v6.0.2
June 2016

http://scaledagileframework.com
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Accelerate delivery through Strategic Reuse
- Integrated and extensible development platform
Strategic Reuse to Accelerate Delivery and Improve Quality

- Reuse development assets to deal with multiple versions, variants or configurations
- Requirements, Code, Design, Tests,
  – DOORS Next Generation
  – Rational Team Concert
  – Rational Rhapsody Design Manager
  – Rational Quality Manager
- Open, federated configuration management enabled by the OSLC Configuration Management draft specification

CLM v6.0
June 2015
**Configuration management** enables parallel development and merging

Some reasons for parallel development
- Shared artifacts
- Overlapping releases
- Product variants
Reuse: branch from base

Each branch is a new product
Global configurations provide scope for streams and baselines and context for links

- Cross-ALM configuration management with traceability
- Component reuse in product line engineering
- Feature modeling with partners
Joint solution with Pure-systems GmbH

1. Define features and their dependencies in pure::variants
2. Map requirements, designs, tests, etc. to features in CE tools
3. Define parameter values and apply them to requirements, etc.
4. Branch a Global Configuration to create a new product variant
5. Use requirement change sets to manage and merge changes
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Integrated and extensible development platform
IBM IoT Continuous Engineering Solution

Rational DOORS & DOORS Next Generation

Rational Rhapsody & Design Manager

Rational Quality Manager

Rational Team Concert
Rational Engineering Lifecycle Manager
Rational Publishing Engine
Rational Method Composer

OPEN PLATFORM
Partner tools and services span the engineering lifecycle

Tap into our Continuous Engineering partners
IBM IoT Continuous Engineering on Cloud

- Reduce costs with subscription licensing
- Optimize operational costs, save IT resources for innovation.
- Scalable, single-tenant virtual private infrastructure
- Expertise to quickly set up and monitor the CE environment
- Always secure and highly available (minimum of a 99.9% SLO)

IoT Continuous Engineering on Cloud products include*:
- IBM DOORS Next Generation on Cloud
- IBM Rational Quality Manager on Cloud
- IBM Team Concert on Cloud
- IBM Engineering Lifecycle Manager on Cloud
- IBM Rhapsody Design Manager on Cloud
- IBM Track and Plan on Cloud

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...we have accelerated our time to market and reduced our build and deployment time by 55%, freeing our developers...

-- Gabriel Lima, methodology manager, Itaú BBA, IBM Corporation

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Hybrid Cloud – These Offerings complement each other

- **CE on Premise**, existing projects on your infrastructure can integrate with projects in the Cloud

- Use **IoT CE/CLM on Cloud** for SaaS subscription and a cloud-hosted solution
  - Expand to SaaS from on-prem using the Bridge to Cloud program
  - IPSEC VPN Tunnel for Virtual Private Cloud

- Use **Managed DevOps/CE** for managed services, by SOW and BYOL:
  - Data migration to SaaS
  - VPN add-on for professional tier
  - Global Config add-on to SaaS
  - 3rd party integrations
  - SaaS + RPE or + a third party tool like GitHub Enterprise, in the same Cloud environment
## Comparing IBM SaaS Offerings Capability differences

<table>
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<th>CE Tool Overview</th>
<th>Track &amp; Plan on Cloud</th>
<th>Team Concert on Cloud</th>
<th>DOORS Next Generation on Cloud</th>
<th>Quality Manager on Cloud</th>
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<td>Developer license</td>
<td>Analyst license</td>
<td>Quality Professional license</td>
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Questions
Thank You

https://jazz.net