



IBM Rational Software Conference 2009
As Real as It Gets!



New IBM Rational Project Management Solution: Concepts and Overview

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Rational. software

PPM04

Introduction

- IBM Rational is developing a new project and portfolio management (PPM) solution that is optimized for Software and System Delivery (SSD) projects
- The new solution includes
 - ▶ Rational Insight for Performance Management,
 - ▶ Rational Focal Point for Project and Program Management
 - ▶ Rational Focal Point for Project Portfolio Management
- This solution is based on the IBM(R) Jazz(TM) platform
- This talk presents the concepts underlying the solutions and gives an overview of each of their components
- It is intended for executives and managers who are responsible for evaluating, selecting, monitoring, and controlling SSD projects

Topics

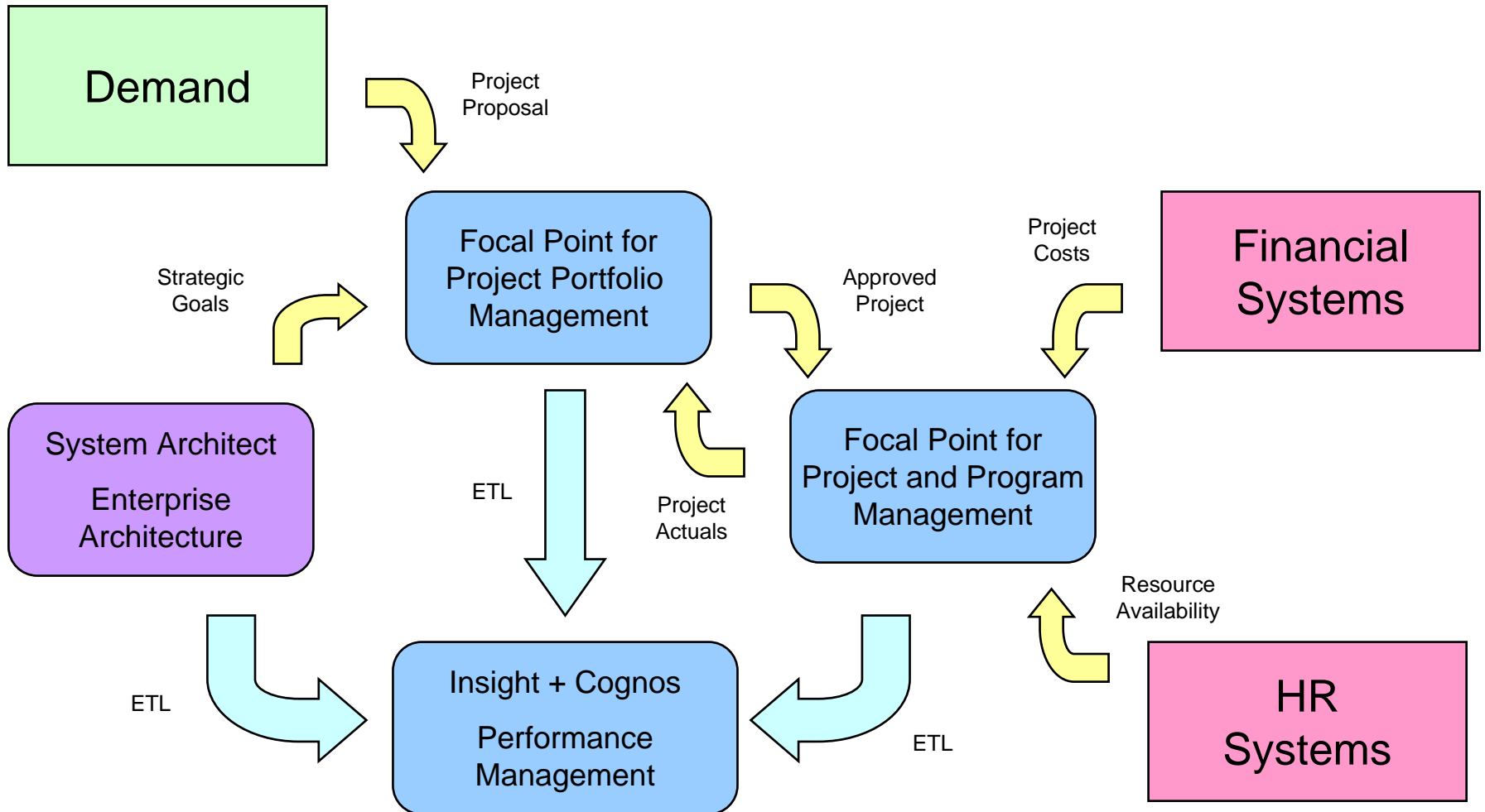
- Overview of the new Rational PPM solution
 - ▶ For detailed product information attend the relevant RSC 2009 PPM sessions
- Optimizing PPM for Software and Systems Delivery
- Demos
- Q & A

PPM Overview

PPM overview

- Rational is adding new PPM products to its Software and System Delivery (SSD) platform:
 - ▶ Rational Insight for Performance Management
 - ▶ Rational Focal Point for Project and Program Management
 - ▶ Rational Focal Point for Project Portfolio Management
- These new products are:
 - ▶ Extensions of existing Rational PPM capabilities
 - ▶ Optimized for SSD projects
 - ▶ Integrated with each other as well as other Rational products
 - System Architect for enterprise architecture and strategic goals
 - ▶ Open to integration with third-party products via REST services
 - ▶ Based either directly on Jazz or align with the Jazz Integration Architecture

PPM context diagram

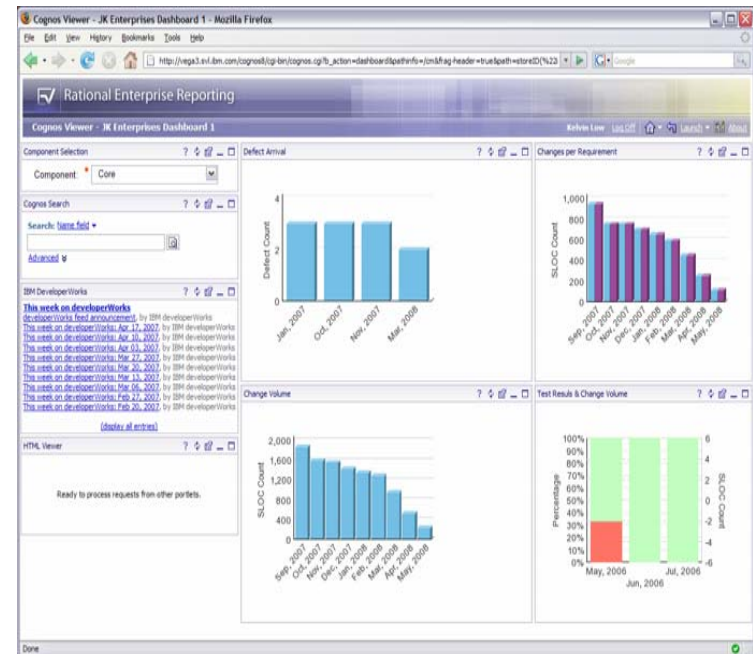


Performance management

- Performance management enables organizations to apply quantitative management techniques to their SSD projects
- Define metrics (KPIs) that are aligned with business goals
- Automatically collect metrics from operational repositories and store them in a data warehouse for reporting and analysis
- Monitor metrics versus targets within allowed variances
- Diagnose root cause of variances and take corrective action
- Quantify benefit of practices and tools
- Track trends over time

Rational Insight for performance management

- A Web portal, based on the Cognos 8 BI reporting engine, to manage reports, queries, dashboards, portlets, alerts, users, and security
- A data warehouse (DB2, Oracle, or SQL Server) used to store and aggregate product data for historical and analytical reporting
- An ETL framework to Extract, Transform and Load data from IBM and other products into the data warehouse
- An open REST-based adapter framework to retrieve product data in a standard XML schema
- An ODBC/JDBC driver to facilitate ETL and real-time reporting against live operational data in Rational products
- A zero-footprint Web-based report designer
- Comprehensive set of customizable OOTB reports, dashboards, and DW schema

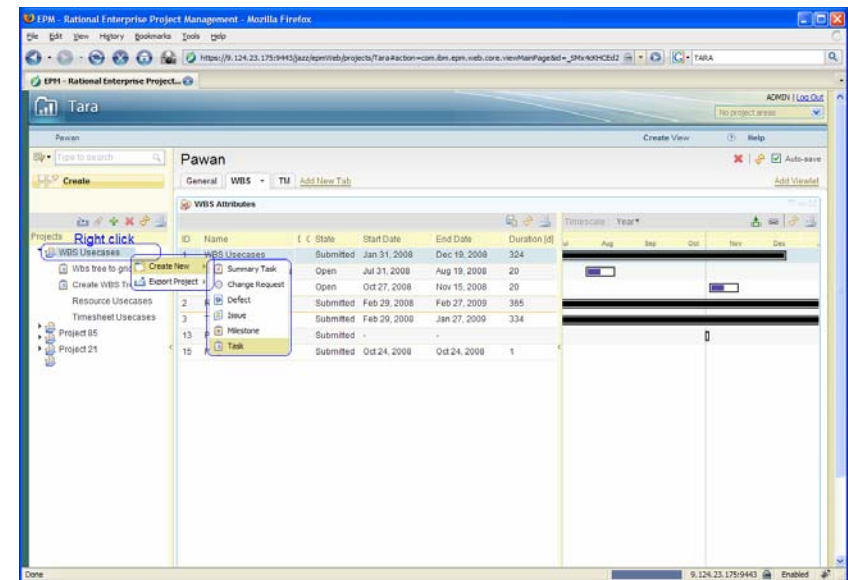


Project and program management

- Projects are time-bounded work efforts that produce a unique result
- Programs are related sets of projects that can be beneficially managed together
 - ▶ Shared resources
 - ▶ Dependencies
- The primary concern here is project execution within the established time, cost, and quality constraints
- Risk here refers to operational risk – an event that might occur and negatively impact the project

Rational Focal Point for Project and Program Management

- A Web-based project and program management solution, optimized for SSD projects, built on Jazz
- Extends the Rational Team Concert work items with project management attributes for cost, schedule, etc.
- Supports WBS, risk management, human resource search and assignment, critical path scheduling, Gantt charts, time tracking
- Integrates with Rational ClearQuest and other change management systems
- Integrates with Rational Focal Point for portfolio management and Rational Insight for performance management
- Supports import/export of Microsoft Project 2007 XML
- Provides REST services for integration with other applications and tools

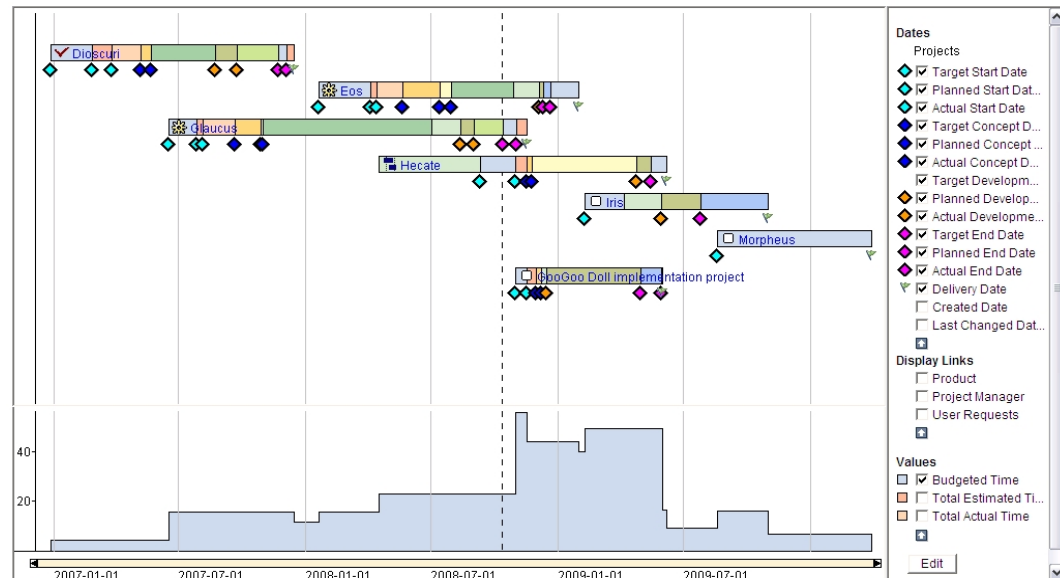


Project portfolio management

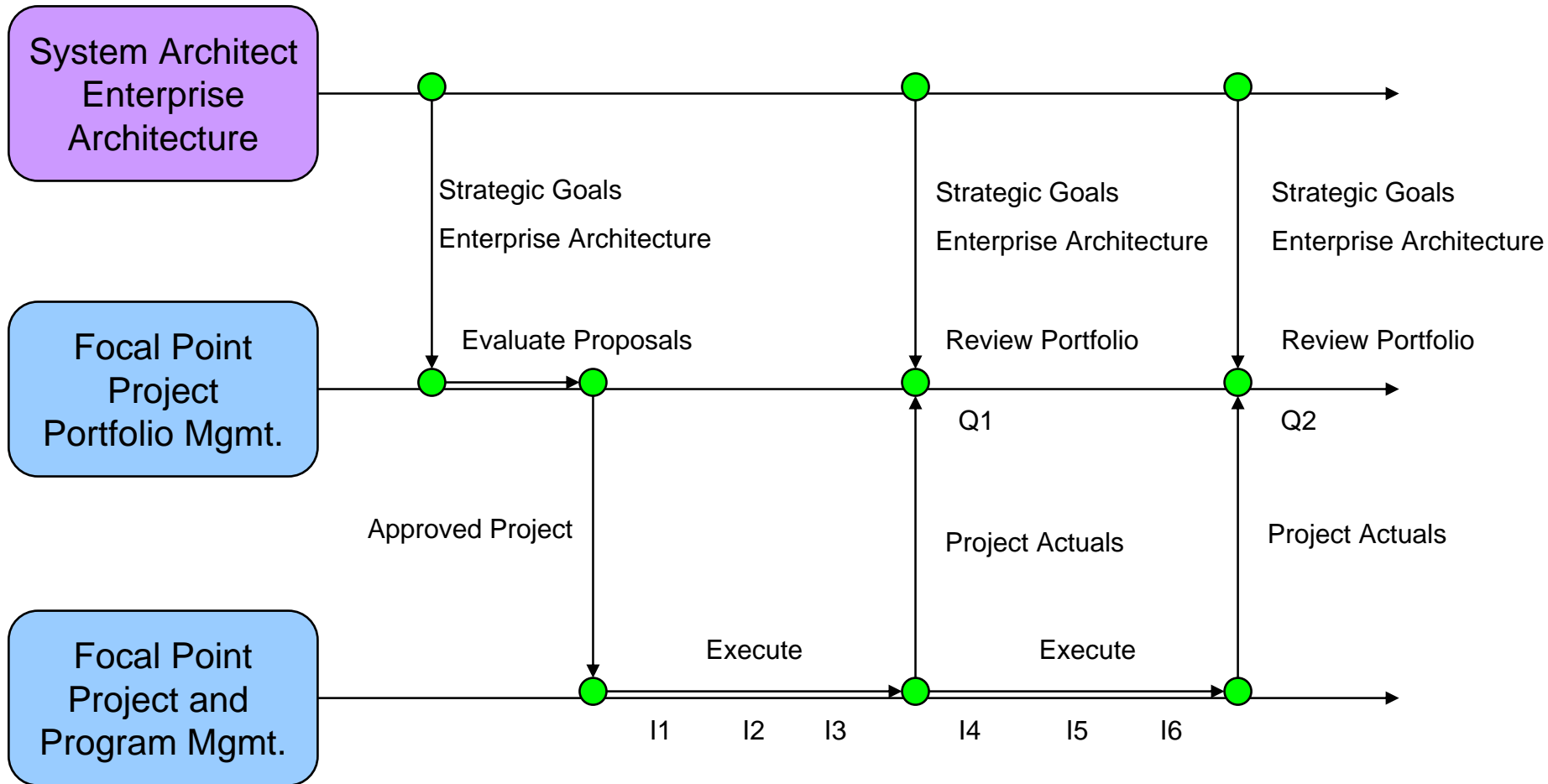
- Portfolios are sets of related projects and programs that can be beneficially managed together from an investment viewpoint
- The primary concern of portfolio management is aligning these investments with strategic business goals and maximizing the value, within established risk criteria
- Risk here refers to investment risk
 - ▶ Investment risk is the uncertainty of realizing the project value
- Portfolio management is a financial discipline, not an engineering discipline
- Portfolio management includes both project initiation and periodic review to ensure ongoing alignment and value
 - ▶ Review may result in project acceleration, deferment, or termination

Rational Focal Point for Project Portfolio Management

- Rational Focal Point supports demand management, high level resource analysis, evaluation and selection of project proposals, and their periodic review.
- Provides support to maintain the inventory of projects with their KPIs.
- Capabilities to balance and align the portfolio with strategy and market needs.
- Implemented with a top-down approach using strategy and business plans as criterion for portfolio analysis.
- Project Portfolio Mgmt. bundled with Project and Program Mgmt. provides a complete solution for project and project portfolio management
- Approved proposals flow from portfolio to project for execution. Project status flows from project to portfolio for periodic portfolio reviews



Project portfolio management: project selection and periodic review processes



Jazz integration architecture

- The primary integration mechanism among the products is REST services
 - ▶ Each tool manages a set of Web resources
 - ▶ Resources have representations, e.g. XML, JSON
 - ▶ Resources are accessed via HTTP methods GET/PUT/POST/DELETE
- Open resource representations are being jointly developed with industry partners at Open Services for Lifecycle Collaboration: open-services.net
 - ▶ PPM scenarios are initially focusing on estimation and measurement
- Jazz Foundation Server provides common services
 - ▶ Identity
 - ▶ Admin
 - ▶ Query
 - ▶ etc.

Optimizing PPM for Software and Systems Delivery

Why optimize PPM for SSD projects?

- Rational's mission is to
 - ▶ “Help organizations automate, integrate and govern the business process of software and systems delivery”.
- SSD is in Rational's DNA:
 - ▶ thought leaders, engineers, products, sales force, customers
- Project management integrates and unifies Rational products across the entire development lifecycle
 - ▶ Requirements, architecture, change, software configuration, build, and quality management tools each address part of the lifecycle
 - ▶ A common notion of “project” across all these tools ties these different aspects together
- SSD projects have unique characteristics that can be beneficially supported by specialized PPM tools
- Rational PPM products must therefore be highly aligned with SSD in order to accomplish our mission and leverage our core competencies

What differentiates SSD projects?

- Project portfolio management
 - ▶ Enterprise architecture
 - ▶ Investment risk
- Project and program management
 - ▶ WBS/CM unification
 - ▶ Process enactment
- Performance management
 - ▶ Development intelligence
 - ▶ Software estimation
- We are building a PPM solution that integrates these differentiating features of SSD to help managers align and steer their projects

Optimizing Project Management for Software and Systems Delivery

Work breakdown structure in project management

- Projects managers create a work breakdown structure (WBS) to decompose the work of the project ultimately into tasks that can be precisely specified, estimated, assigned, and tracked
- Tasks and their dependencies can be visualized using Gantt charts, PERT charts, network diagrams, etc.
- The WBS can be analyzed to yield schedule information, e.g. critical path
- Cost and effort are rolled up from the task level to the project level

Change management in software development

- Software development teams rely heavily on change management (CM) systems to manage defect and feature tasks
- CM systems are often linked to software configuration management (SCM) systems, e.g. unified change management (UCM)
- Rational ClearQuest, Rational Team Concert, Rational Change, Bugzilla, Atlassian JIRA are examples of CM systems
- CM systems are flexible enough to manage generic tasks, but lack some traditional WBS features

WBS/CM unification

- If a software project uses different tools for WBS and CM then
 - ▶ The project manager will have to poll the team for their status
 - ▶ The project manager will have to update the WBS to reflect the CM tasks
 - ▶ The WBS will diverge from the CM system
 - ▶ The WBS will cease to reflect the truth
- Therefore in our PPM solution the tasks that developers see in the CM system are the same as the tasks the project manager sees in the WBS
- Project managers assign tasks in WBS and developers see their assignments in the CM system
- Developers report their status in the CM system and project managers see that status in the WBS

Task 53: Conduct Sprint Review - Rational Enterprise Project Management - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://localhost:9443/jazz/epm/projects/Tara#action=com.ibm.epm.workitem.viewWorkItem&id=53

Tara ADMIN | Log Out

Project Areas Dashboards Work Management Resource Analysis Financials

Project1

Previous | 1 - 1 of 1 | Next

Scope Planned Work **Gantt** Resources Financials Description

Work Breakdown

Projects	Start Date	Finish Date	Duration(d)	Remain
Project1	2008-05-18	2008-09-29	135	
Iteration 1	2008-05-19	2008-09-29	134	
DCUT	2008-05-19	2008-06-22	35	
Add new Tab for Res	2008-05-19	2008-05-19	1	
Create Planned Tab	2008-06-19	2008-06-22	4	
Create Tree Structure	2008-05-28	2008-06-01	5	
Defect 5	2008-06-01	2008-06-01	1	
Implement Gantt Tab	2008-05-21	2008-05-25	5	
Implement Tabbed V	2008-05-30	2008-06-01	3	
Tree Defect	2008-06-01	2008-06-01	1	
FVT	2008-05-31	2008-09-22	115	
Planning	2008-05-19	2008-05-19	1	
SVT	2008-06-01	2008-09-29	121	
Create Dashboard V	2008-08-16	2008-09-29	45	
Define SVT scenario	2008-06-01	2008-06-05	5	
Iteration 2	2008-05-18	2008-06-17	31	
Project2	2008-03-16	2008-09-29	198	
Iteration 7	2008-03-16	2008-09-29	198	

25 May 2008 01 Jun 2008 08 Jun 2008 15 Jun 2008 22 Jun 2008

Done localhost:9443

project manager views Gantt chart in the web client

Task 53: Conduct Sprint Review - Rational Enterprise Project Management - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://localhost:9443/jazz/epm/projects/Tara#action=com.ibm.epm.workitem.viewWorkItem&id=53

Tara ADMIN | Log Out

Tara

Project Areas Dashboards **Work Management** Resource Analysis Financials Demand Management Reports Admin

Project1

Previous | 1 - 1 of 1 | Next

Type to Filter

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Add Defect	2008-05-19	2008-05-19	1	
Create Story	2008-06-01	2008-06-01	4	
Create RFS	2008-05-28	2008-06-01	5	
Create Plan Item	2008-06-01	2008-06-01	1	
Defect Enhancement	2008-05-21	2008-05-25	5	
Implement Task	2008-05-30	2008-06-01	3	
Implement Tabbed V	2008-06-01	2008-06-01	1	
Tree Defect	2008-06-01	2008-06-01	1	
FVT	2008-05-31	2008-09-22	115	
Planning	2008-05-19	2008-05-19	1	
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Iteration 7	2008-03-16	2008-09-29	198	

25 May 2008 01 Jun 2008 08 Jun 2008 15 Jun 2008 22 Jun 2008

project manager creates new task

Done localhost:9443

Task 53: Conduct Sprint Review - Rational Enterprise Project Management - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://localhost:9443/jazz/epm/projects/Tara#action=com.ibm.epm.workitem.viewWorkItem&id=53

ADMIN | Log Out

Tara

Project Areas | Dashboards | **Work Management** | Resource Analysis | Financials | Demand Management | Reports | Admin

Project1

previous | 1 of 1 | Next

Type to Filter

Scope | Planned Work | **Gantt** | Resources | Financials | Description

Work Breakdown

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Project1	2008-03-16	2008-09-29	198
Iteration 1	2008-05-18	2008-06-17	31
DCUT	2008-05-19	2008-06-22	35
Add new Tab for Resource I	2008-05-19	2008-05-19	1
Conduct Sprint Review	2008-06-02	2008-06-02	1
Create Planned Tab View	2008-06-19	2008-06-22	4
Create Tree Structure	2008-05-28	2008-06-01	5
Defect 5	2008-06-01	2008-06-01	1
Implement Gantt Tab View	2008-05-21	2008-05-25	5
Implement Tabbed View	2008-05-30	2008-06-01	3
Tree Defect	2008-06-01	2008-06-01	1
FVT	2008-05-31	2008-09-22	115
Planning	2008-05-19	2008-05-19	1
SVT	2008-06-01	2008-09-29	121
Create Dashboard Viewlet	2008-08-16	2008-09-29	45
Define SVT scenarios	2008-06-01	2008-06-05	5
Iteration 2	2008-05-18	2008-06-17	31

new task created in WBS

Done

localhost:9443

Work Items - Tara - Team Concert

File Edit Navigate Search Project Code Audit Run Window Help

Team Artifacts Team Central

All Team Areas (1 of 1 Team Areas selected)

Repository Connections
ADMIN@localhost
Tara [localhost]

- Builds
- Plans
- Reports
 - My Reports
 - Shared Reports
 - Build
 - Data Warehouse
 - Repository
 - Source Control
 - Work Items
 - Blocking Work Items
 - Burndown
 - Closed Work Items Daily
 - Defect Backlog
 - Defect Discovery Rate
 - Deferred Work Items
 - New Work Items by Severity
 - Open vs Closed Work Items
 - Open Work Items by Type
 - Story Points
 - Team Velocity
 - Work Item Comparison
 - Work Items by Owner
 - Work Items by Priority
 - Work Items by Team Area
 - Report Templates
- Streams
- Work Items
 - My Queries
 - Shared Queries
 - Predefined

53: Conduct Sprint Review

Task 53

Summary: * Conduct Sprint Review

Details

Type: Task
Severity: Normal
Found In: Unassigned
Created: Jun 2, 2008 6:03 AM
Created By: ADMIN
Team Area: Tara Team / Tara
Filed Against: * Tara
Tags:

Description

Owned By: Unassigned

task appears in developer's RTC Eclipse client

Work Items Problems Plug-ins

Found 39 work items - Open created by me

	I	Status	P	S	Summary	Owned By
	53	New			Conduct Sprint Review	Unassigned
	52	New			Defect 5	Unassigned
	50	New			Tree Defect	Unassigned
	49	New			Defect 1	Unassigned
	47	New			Test task 3	Unassigned
	46	New			Test Task2	Unassigned
	45	New			Test Task	Unassigned
	43	New			Create New Resource Plan	Unassigned
	41	New			New work item	Unassigned
	40	New			Saving new defect with parent set	Unassigned
	38	New			Create Tree Structure	Vijay Kumar
	37	New			Create Planned Tab View	Unassigned
	35	New			SVT Planning	Juan Dao

<No Current Work>

Microsoft Project interoperability

- Many project managers and related tools work with MS Project documents
 - ▶ Our PPM solution therefore supports interoperability with MS Project
- For project creation, import an MS Project file into our project management system
- For status reporting and review, export an MS Project file from our project management system
- We use the MS Project 2007 XML format
 - ▶ No Windows dependencies
- We provide a public REST service API to access projects using MS Project 2007 XML format

Projects and operations

- Work can be divided into two broad categories which are managed very differently:
 - ▶ Projects
 - ▶ Operations
- Projects are time-bounded work efforts that produce a unique result
 - ▶ e.g. engineering, construction
- Operations are recurring work efforts that are repetitive in nature
 - ▶ e.g. manufacturing, accounting, order processing

Operationalizing SSD

- SSD is, in general, project work
- However, we'd like it to be more repeatable and predictable
 - ▶ Rational's mission is to "Help organizations automate, integrate, and govern the *business process* of SSD."
 - ▶ The goal Capability Maturity Model (CMMI) is, in a sense, to operationalize SSD organizations, see Level 3 - Defined
 - ▶ For the more repeatable types of work, asset reuse and factory automation concepts are being applied
- Our PPM solution incorporates process adoption, management and enactment
 - ▶ Measured Capability Improvement Framework (MCIF) – adopt
 - ▶ Rational Method Composer – define and manage
 - ▶ Jazz Process Engine - enact

Processes and practices

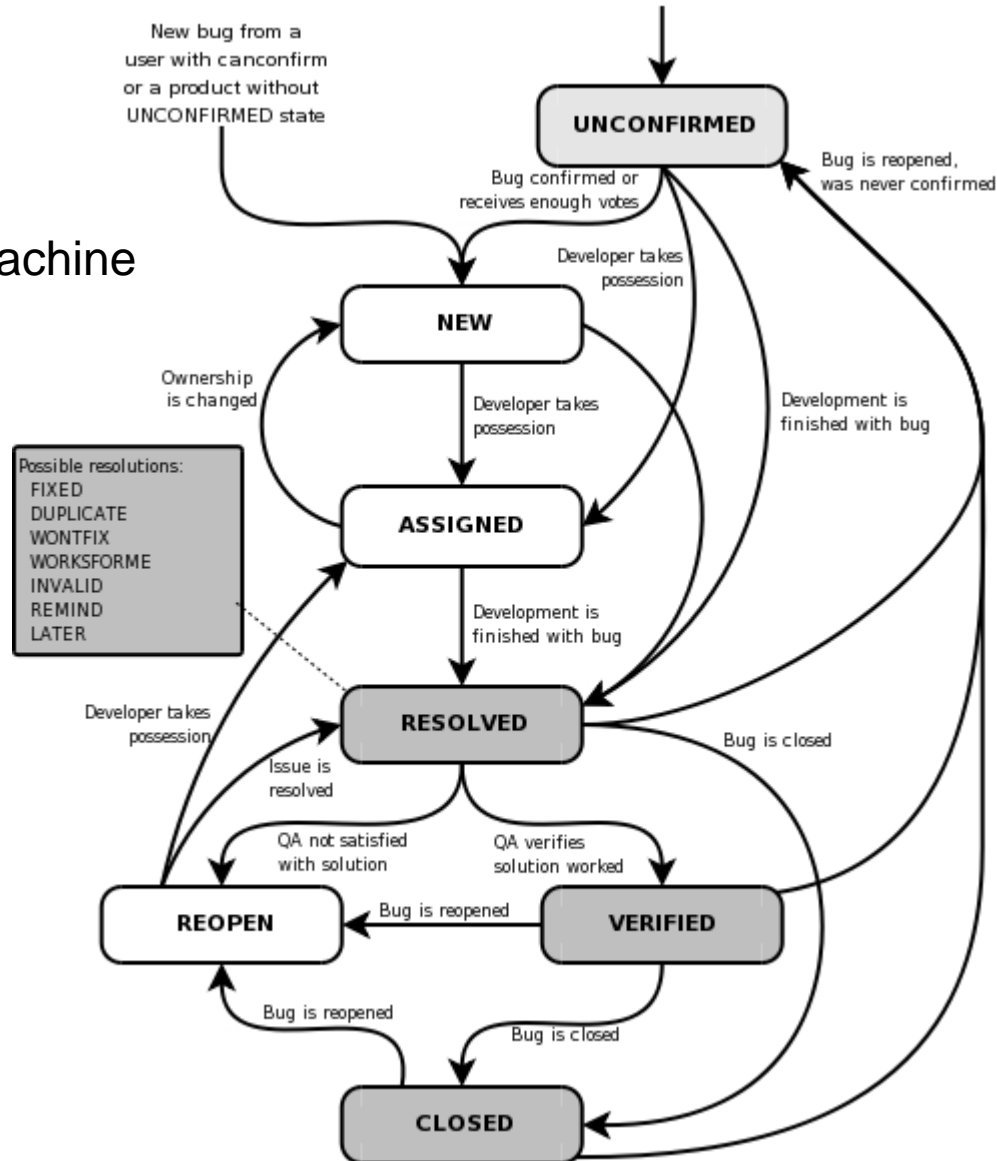
- Our industry has seen many methodologies and processes proposed for SSD
 - ▶ e.g. Rational Unified Process, Extreme Programming, The Eclipse Way, Agile Development
- These processes are often too complicated for organizations to fully adopt
- These processes are composed of many smaller sub-processes or best *practices*
 - ▶ e.g. Extreme Programming defines 12 practices (Pair Programming, Refactoring, ...)
- Best practices are often common to many larger processes, are focused on some narrower problem area, and are easier to adopt
 - ▶ e.g. iterative development produces working code earlier, helps prioritization, and reduces schedule risk
- Rational Measured Capability Improvement Framework helps organizations assess their needs for improvement, select targeted practices, and monitor their adoption

Tasks and state machines

- Processes specify the tasks that people perform on artifacts (aka work products) to achieve some result
- A process may be applied repeatedly within a project, e.g. fix a bug
- A project manager could explicitly add all the process steps to the WBS, however
 - ▶ The WBS would get large and complex
 - ▶ Some important relations between the tasks would be lost
- A more suitable approach for SSD projects is to focus on the artifacts
 - ▶ Describe the artifact lifecycle as a state machine
 - ▶ Use role-based permissions to govern the state transitions
 - ▶ Use the current state as an indicator of progress
 - ▶ Treat the tasks as “virtual” WBS elements
- Therefore, we should stop elaboration of the WBS at the level where processes can be enacted by artifact state machines



Bug report state machine



RACI matrices

- RACI is a technique for defining roles and decision rights in a process
 - ▶ R – who is Responsible for doing the work
 - ▶ A – who is Accountable for the work getting done, usually who Approves the work
 - ▶ C – who must be Consulted about the work
 - ▶ I – who must be Informed about the work

Fix bug	Assign	Resolve	Verify	Close
Manager	A			I
Lead	R	A	I	A
Developer	I	R	A	R
Architect		C		
Reporter		I	R	I

Process enactment directions

- Process enactment is ability to implement processes in a project through the use of tool guidance and active assistance or enforcement
- In the Jazz platform, process enactment is accomplished by components that listen to artifact lifecycle events and execute pre- and post-conditions checks
 - ▶ Process enactment is configured in a process specification
 - ▶ Artifact lifecycles are modeled as state machines
 - ▶ Role-based permissions are defined on the state transitions
- Rational Method Composer is becoming more integrated with the Jazz platform
- In SSD, the project manager can therefore promote the uniform adoption of processes by enacting them in the platform

Development intelligence

- Metrics that describe the lifecycle of SSD artifacts can be extracted from tool repositories and loaded into a data warehouse for further analysis, e.g.
 - ▶ Requirements activity
 - ▶ Source code growth
 - ▶ Defect discovery and resolution
 - ▶ Build health
 - ▶ Testing activity
- We can apply Business Intelligence techniques to SSD metrics to yield *Development Intelligence*
 - ▶ Dashboards, alerts, cross-tabs, drill up/down/through apply equally well to SSD metrics
 - ▶ Project managers can monitor metrics, compare them with estimates, detect unacceptable variances, determine root causes, take corrective actions
 - ▶ More advanced analysis can be performed – the SSD analog of data mining
 - We can tap academic research on Mining Software Repositories

Development intelligence tools

- Measuring and displaying software metrics is well-established idea, e.g.:
 - ▶ Rational Project Console
 - ▶ Telelogic Dashboard
- Rational Team Concert has integrated reports and dashboards
- We are taking this capability to the next level by integrating IBM Cognos 8 BI into our products
 - ▶ Rational Insight – extensible, cross-domain enterprise reporting
 - ▶ Domain-specific Rational products, e.g. Rational Quality Manager – custom product reporting
- We are working with IBM Research to develop new development intelligence capabilities and integrate them into our PPM solution

Software Estimation

- Measuring software metrics is the first step towards quantitative management (CMMI Level 4), but is in itself not sufficient
- Project control requires a knowledge of the expected value, and the acceptable limits of variation for any metric
- There is a mature body of knowledge (30+ years) on the topic of estimating software projects
 - ▶ We are working with leading business partners
 - Galorath - SEER
 - PRICE Systems - TruePlanning
 - QSM - SLIM
 - ▶ We are working together at Open Services for Lifecycle Collaboration
- Software estimates can be improved by calibrating models based on your organization's actual performance
 - ▶ e.g. tracking team velocity in Agile projects
 - ▶ “All models are wrong, but some are useful.” – George Box

Summary

- Rational's DNA is SSD projects
- PPM is a key organizing concept across the SSD lifecycle
- Our mission is to optimize PPM for SSD

Questions

Thank You

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