

Software Group

Enterprise Modernization

Lowering the cost of multi-platform application development and delivery through Application Portfolio Management

September 30th 2009

Michael Connor – Segment Manager

connomon@us.ibm.com

Agenda

- An introduction to how portfolio management can help in the application delivery process
- An overview of key parts of the IBM portfolio management solution
- A Drilldown into select capability and fit of Rational Asset Analyzer

Change is the new norm



There are **1 billion** camera phones in use today

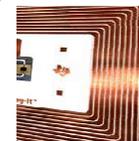


IBM Sequoia Super Computer...

It would take the **entire population of the earth** billion, each of us working a handheld calculator the rate of one second per calculation **more than 320 years** to do what Sequoia can do in one day.

“8 of 10 CEOs see significant change ahead”
- 2008 IBM CEO Survey

The **internet of people** is over one billion strong. The **internet of things** is almost one trillion.



By 2010, there will be **30 billion RFID tags** in circulation

Soon there will be over **2 billion people** on the web



China sends more text message in a **week** than the U.S. does in **1 year**



Change can be ~~very disruptive~~ an opportunity

IT skills shortage reaches highest level in 10 years

All software systems crashed due to software bug when F-22 flew over international dateline



50% of outsourced projects are expected to under perform

“The gap between expected change and the ability to manage it has almost tripled since 2006.”
– 2008 IBM CEO study

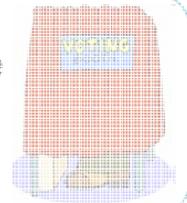


COBOL thwarts California's "Governator"

North Carolina Jobless Claims Crash State's Web Site



Ohio election web site shut down after being hacked



View fashion shows and collections on your iPhone



Malta is building a smart grid to link the power and water systems

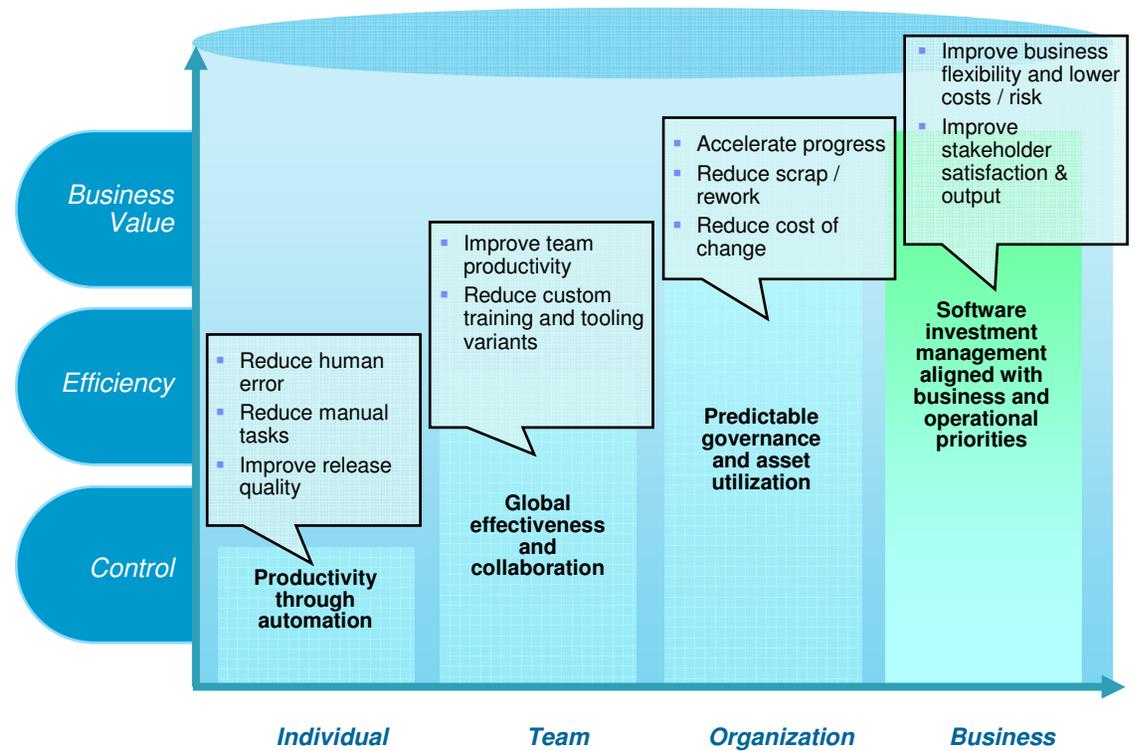


Mobile phone provider "3" launches new handset to allow users to make free calls via Skype

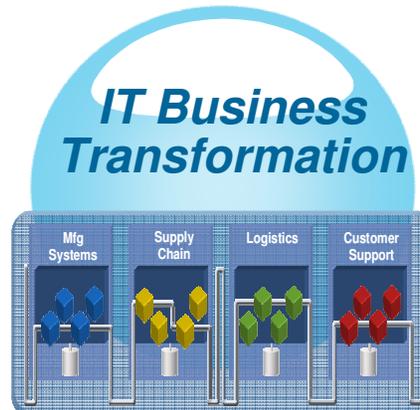
Is your IT infrastructure flexible enough?



VS



Rational's 3 solution areas



- **Enterprise Modernization** – leverage a consolidated infrastructure to harness the same power and flexibility for all types of applications, no matter what platform they are deployed on
- **IT Business Transformation** – align your IT infrastructure with your business strategy and vision to innovate new business strategies and meet long term objectives
- **Complex/Embedded Systems** – deliver innovative software for your products, while integrating across mechanical, electronic, and software domains

Key modernization challenges for IT organizations



"We don't understand the effort, risk and impact of modernizing our legacy software portfolio"



"Our skills gap just seems to keep growing. How do we stay current with all the language and technology changes?"



"Our architecture has evolved to be too complex and convoluted— we need to be flexible and agile."



"Our development teams working on different platforms are struggling to communicate. How do we collaborate in the context of our work?"

Application Challenges

- Lost application knowledge
- Architectural complexity
- Poor quality and performance
- Regulatory and compliance risks

People Challenges

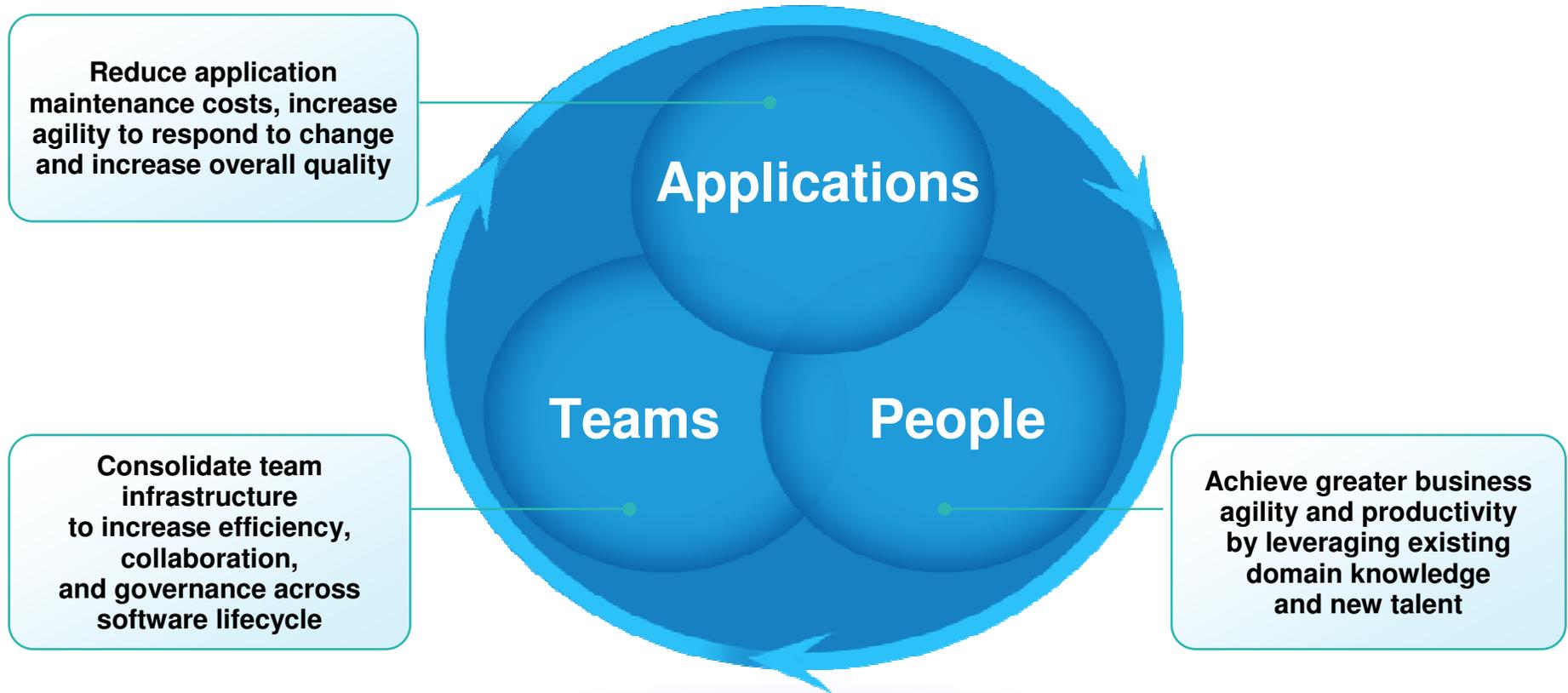
- Skills lock-in
- Plethora of new technologies
- Unattractive, low productivity IDEs
- Steep learning curve due to platform/language-unique tools

Team Challenges

- Poor communication
- Incompatible tools & processes across platforms
- Weak project oversight
- Lack of traceability across lifecycle

Enterprise Modernization solutions

A smarter way to maximize the value of your applications, people and teams



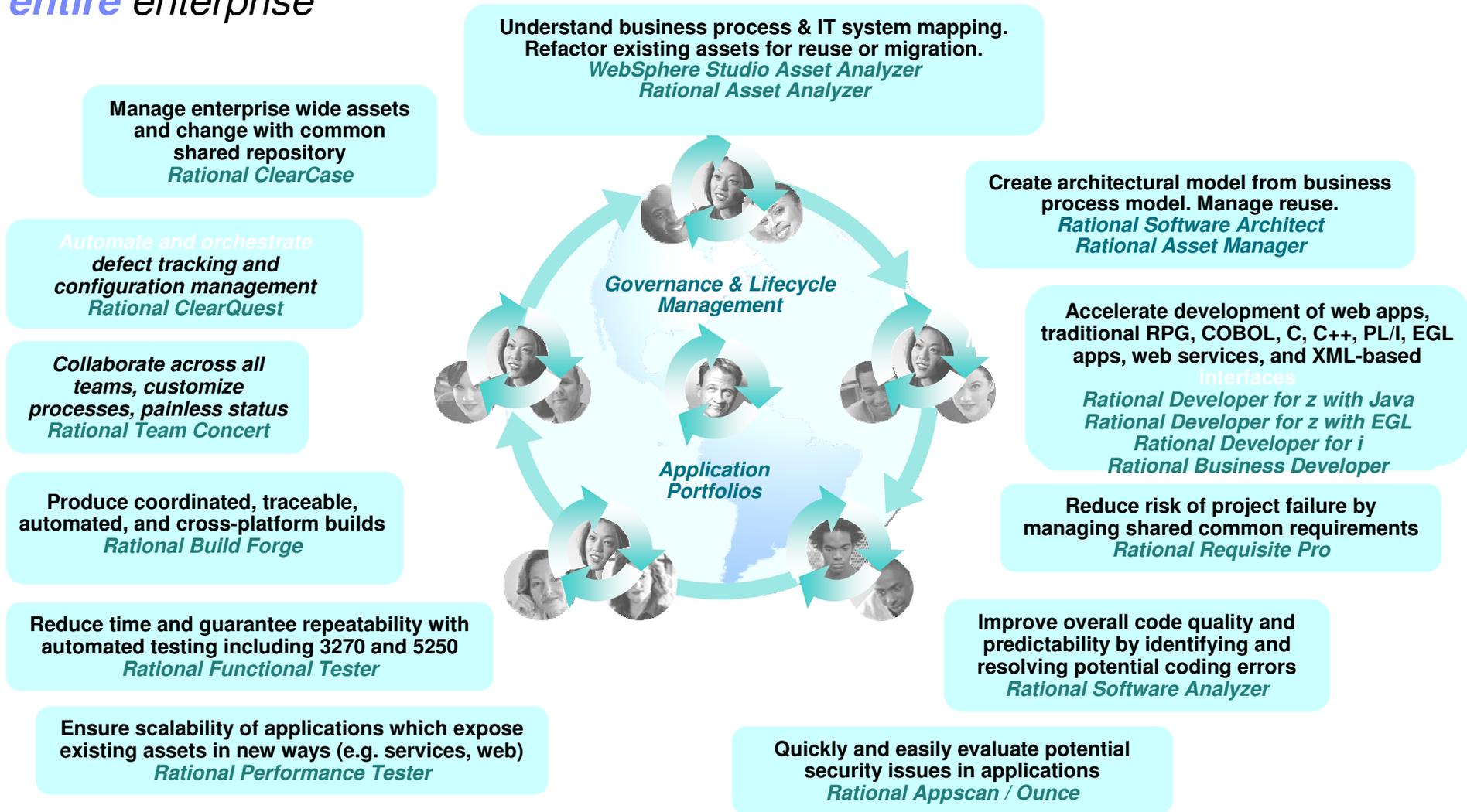
For more information, visit:
www.ibm.com/rational/modernization

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The Rational Software Delivery Platform

*Application Intelligence can help accelerate software innovation for the **entire** enterprise*



Application Portfolio Management (APM) Defined

- APM uses the lessons of financial portfolio management to justify and measure the financial benefits of each application in comparison to the costs of the application's maintenance and operations.

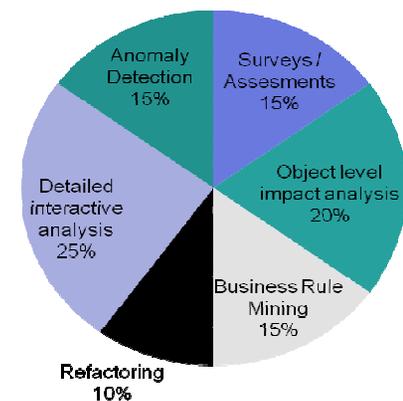
APM capabilities traditionally falls into these 6 areas.

- APM provides detailed insight into how complex applications support core business processes. This understanding increases both developer productivity and accuracy and enables fact based “Smart” application modernization decisions to be made....source: Wikipedia

- APM is not a domain that stands alone. Connections include:
 - ...more meta data about application portfolios like business value
 - ...the broadest set of tooling for the SDLC across the broadest spectrum of users –executives to managers to coders to testers to operations.
 - ...the best technology platforms to convert complex data into actionable information: Cognos / Jazz

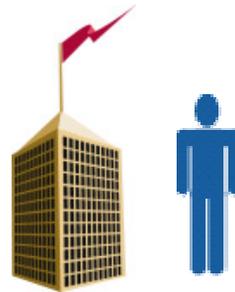
The goal ... make information actionable

Segmentation



Possible paths of Actionable Applications

- Business-centered measurements create a true business case for development activities
- Shared knowledgebase provides intelligence needed to execute identified development priorities



Maintain / Invest

Increase efficiency and ROI of ongoing activities

Retire

Consolidate with other applications / Business Process Outsourcing

Redevelop

Identify logic that can be reused as functional specifications for redevelopment activities

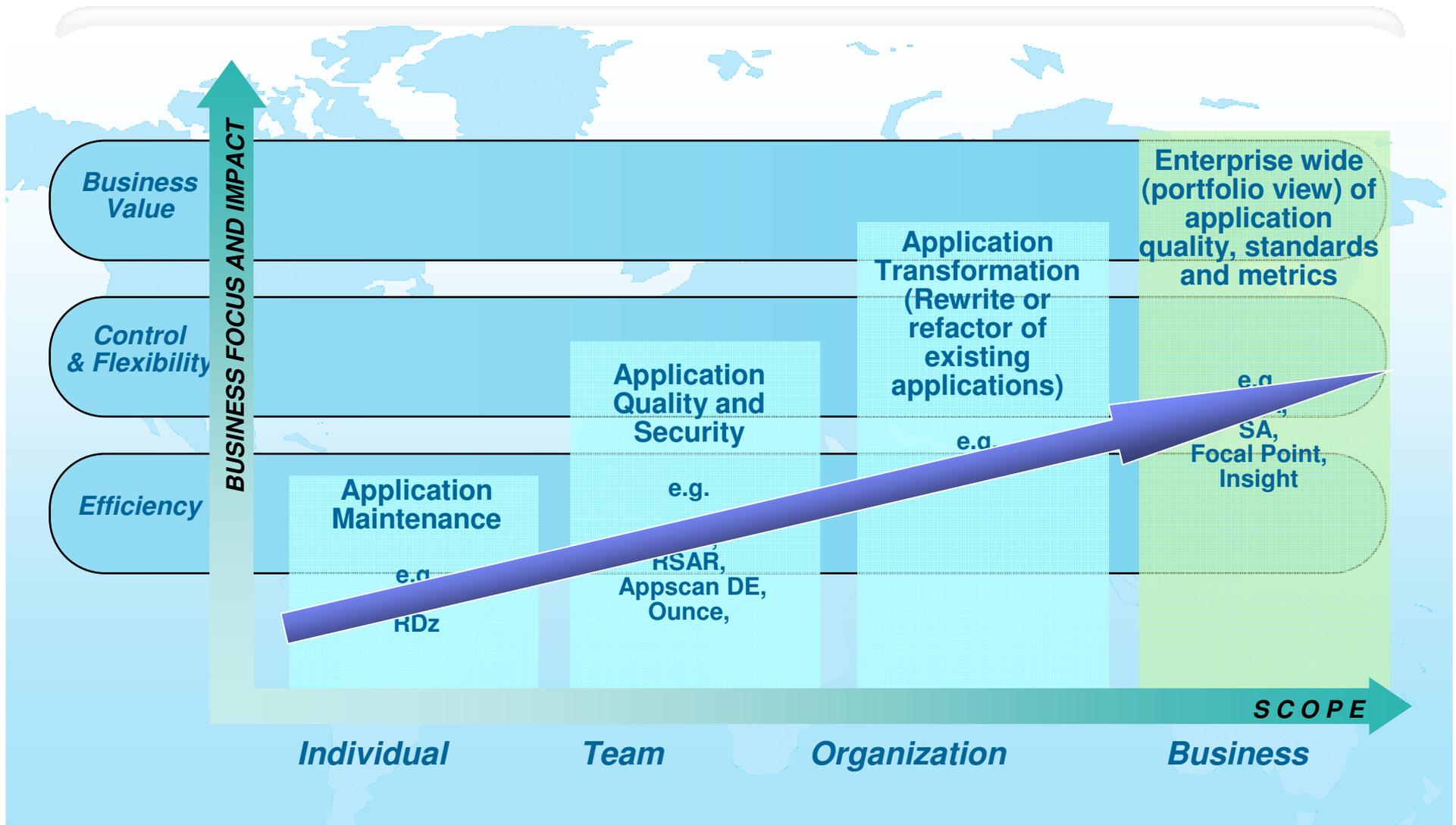
Modernize

Evolve to SOA, realign with critical business requirements, repurpose

Re-architect

Functionally segregate non-brand enhancing components. Identify and correct architectural challenges, replace aging components

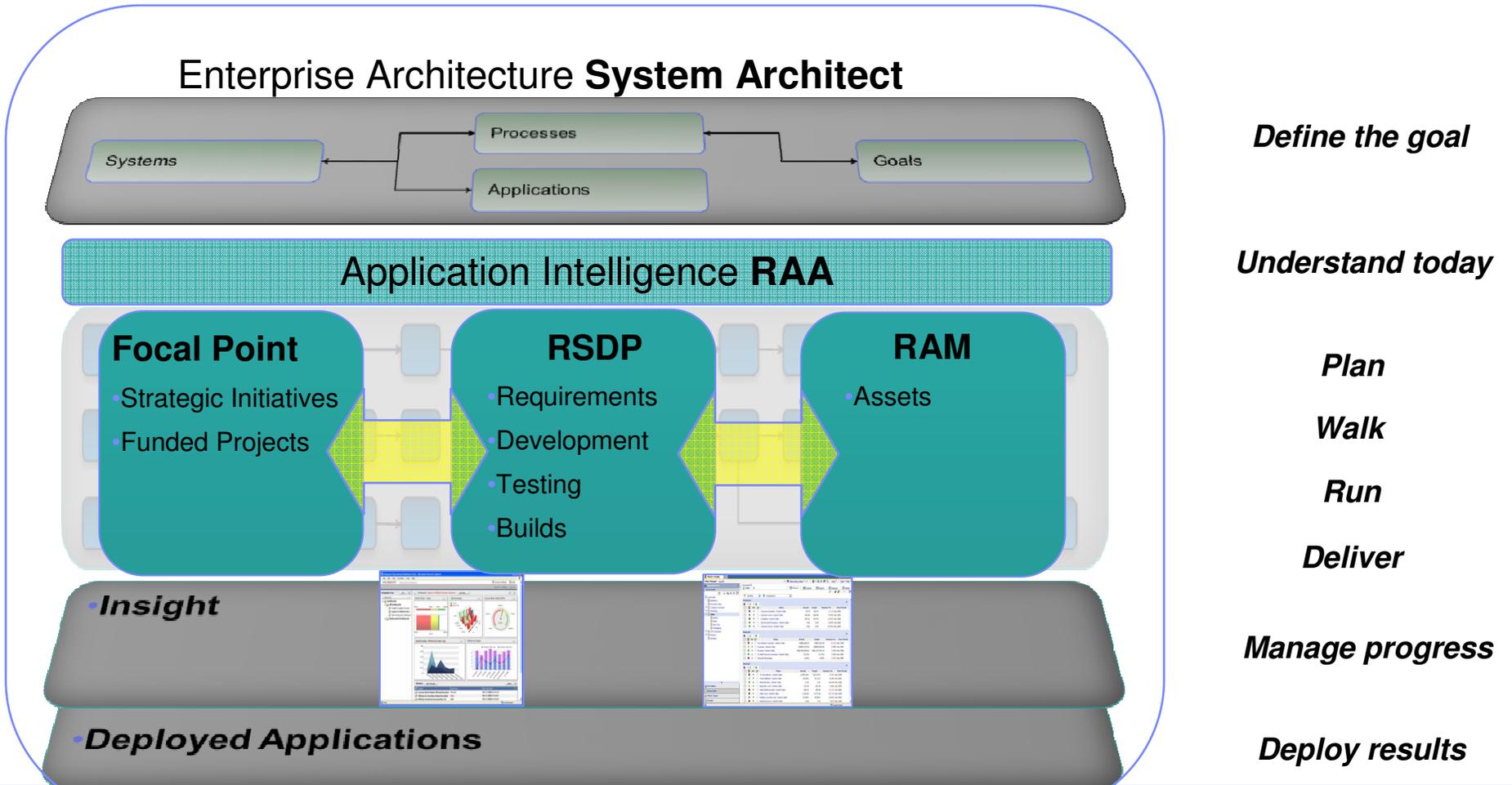
Applications: Leveraging Intelligence across the org.



Application Intelligence

Related domains that span portfolio management

Portfolio View



Manage the impact of change, consolidation and M&A

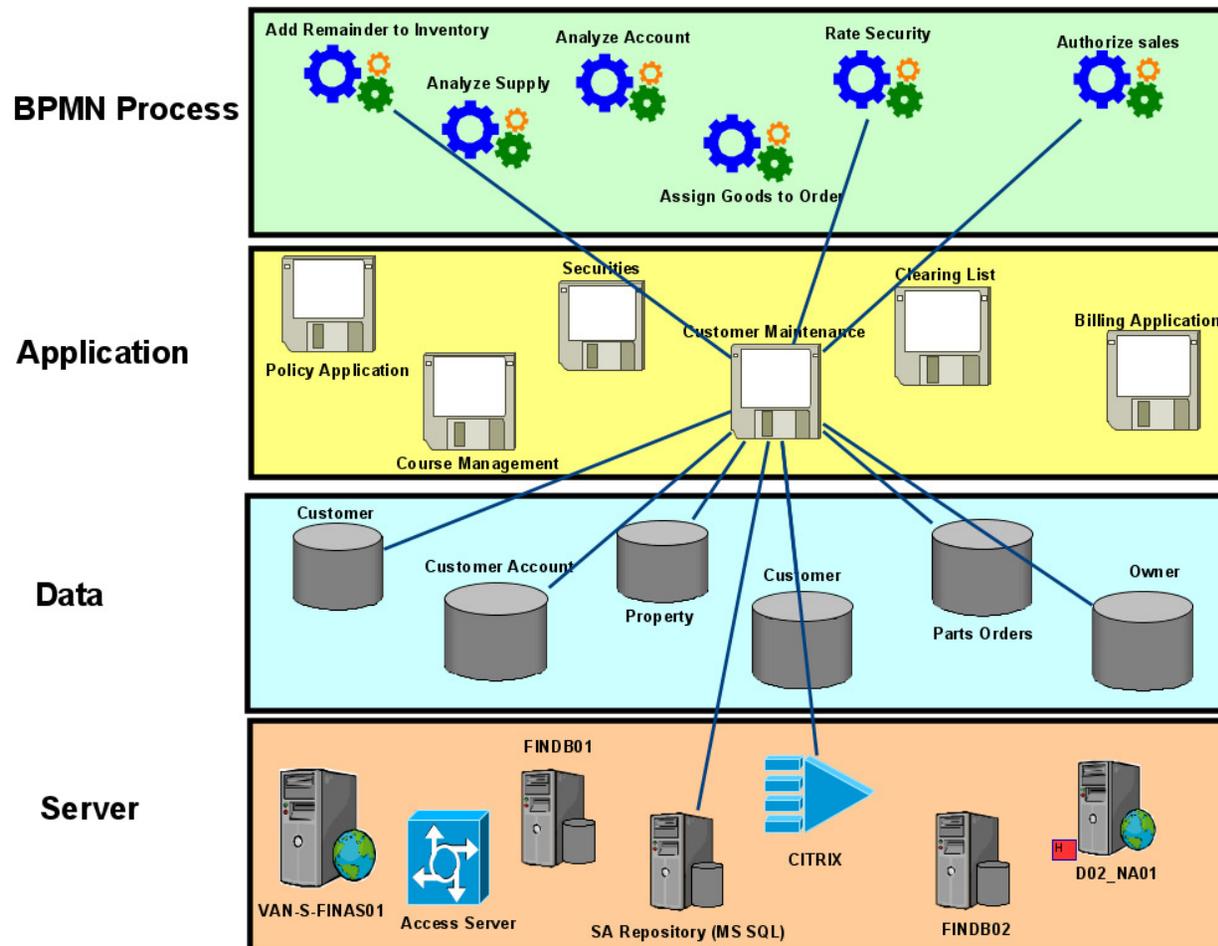
Increase operational efficiency, reduce recurring costs and mitigate risks

- Gain clarity in enterprise decision making
 - Enhanced web collaboration creates a common perspective of the organization, from one location
 - New enterprise search quickly reveals critical data required for accurate decisions
- Identify redundancy and reuse of business and technology assets
 - Enhanced heat maps report IT information in business-friendly formats
- Identify and minimize execution risk
 - New “work space” feature groups information for more accurate integration planning



“We used enterprise architecture to guide the consolidation of our US operations in an efficient and cost-effective manner.”

Visualize the enterprise and the impact of change



Align investments with business objective

Portfolio Management

Increase investment value by avoiding off-strategy projects that waste an average of 10% of IT budgets*

- Measure, analyze and objectively evaluate investment scenarios
 - Focus on business direction and strategy, rather than resource utilization
 - Pre-configured product portfolio workspace, backed by best practices provides day-1 productivity

- Central oversight of budget, risks, demands and investment management
 - Information captured at all levels of the organization (in one solution) for consistent decision making
 - Analyze and prioritize enterprise architecture work identified by Rational System Architect



“Reduce cost per project by 37%, eliminate 78% of redundant projects, and increase IT staff productivity by 14%.”*

v6.4

Rational Focal Point for Product and Portfolio Management

* Source: IDC whitepaper, “How Project and Portfolio Management Solutions are Delivering Value to Organizations”, September 2008

Improve predictability of product success

**Product
Management**

*Improve investment strategy to drive 20% higher margin in the market**

- Organize work around value; identify and sequence activities and deliverables
 - Perform cost/benefit and trade-off analysis to make informed investment decisions
 - Quickly align and adjust roadmaps to changing market needs and business value
 - Decision-making based on objective information for strategic and agile roadmaps

- Analyze stakeholder needs to drive scope and objectives
 - Understand the market needs that will return value to the business
 - Information captured at all levels of the organization via a collaborative web environment



“By enhancing our decision making, [IBM Rational] has helped us choose the products and features that deliver the greatest customer and business value. This has improved our productivity and reduced costs because we are developing the right products for our markets.”

Tobias Chyssler, Product Management
ABB Process Automation

v6.4

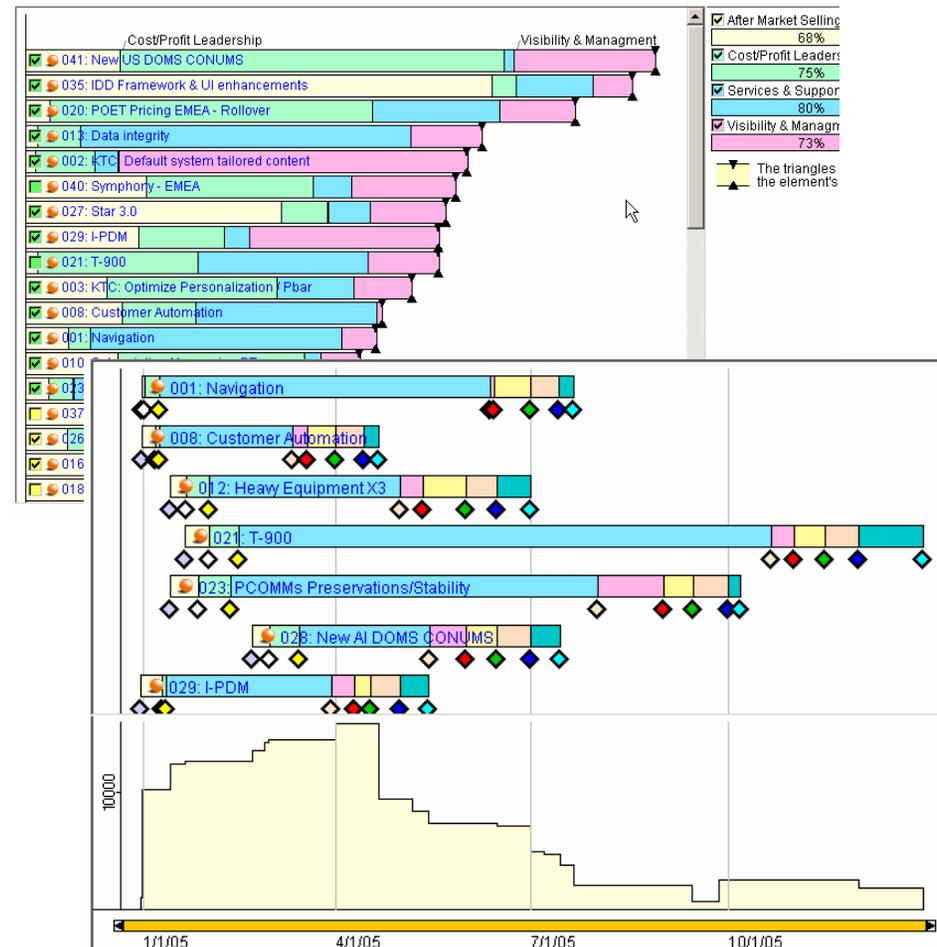
**Rational Focal Point for Product
and Portfolio Management**

* Source: Aberdeen Group Study, “The Product Portfolio Management Benchmark Report”, August 2006

Focal Point

The *right* initiatives at the *right* time

- **Automated Idea Capture**
capture ideas and product requirements from internal stakeholders and customers
- **Value-Based Selection**
Understand customer value when making decisions about initiatives
- **Best Practices Support**
Leverage investment in best practices for key management activities



Manage and optimize project execution

Project Management

Enable collaborative and process-driven execution to overcome the issues that cause 59% of projects to fail*

- Reduce delays and mistakes with real-time, “in-context” collaboration
 - Built on the Jazz open architecture to transparently and seamlessly integrate across disciplines or the entire application lifecycle
 - Software as a Service (SaaS) for lower cost of ownership, ease of deployment and faster time to market
- Guide teams on best practice processes for increased consistency and predictability
 - Supports traditional, agile and hybrid methodologies
 - Leverages best practices and the integrated IBM Rational Software Delivery Platform
- Validate investments continually
 - Analyze and estimate costs, benefits and risks; redeploy resources with changing priorities



Beta program ongoing

Rational Focal Point for Project Management

* Source: IBM Study, “Making Change Work” (<http://www-935.ibm.com/services/us/gbs/bus/pdf/gbe03100-usen-03-making-change-work.pdf>), 2008

Crystallize business priorities for IT action

Make planning actionable

- Prioritize competing projects and supporting investments
 - ▶ New integration enables cost-benefit and trade-off analysis of the business and IT architecture
 - ▶ Enable collaboration on priorities across broad constituencies
- Show impact of portfolio decisions
 - ▶ New workflow to extend application planning into enterprise architecture
- Assure projects remain aligned with business goals
 - ▶ New IT roadmaps guide planning to successful outcomes



v11.3 Rational System Architect

v6.4 Rational Focal Point for Product and Portfolio Management

New Integrations

IBM Unique Offering

Solution: Facilitate asset collaboration, governance, and enterprise architecture adoption

- ✓ Understand and leverage artifacts used to develop and build assets
Identify an asset's versioned artifacts quickly
- ✓ Submit change requests for an asset
Track and fix problems quickly - all in the same IDE!
- ✓ Increase productivity
Develop code in a team environment
Integrate with a customer's existing environment
Search, create, reuse and communicate created assets

#	Id	Sev	Headline	Owner	FixInVersion	FixIteration
1	RATLC01109376	DS2	BUG126934: HTML 4.01 TRADITIONAL VALIDATION OMITTS PROBLEMS	dmwillia	7.0	IFix 001
2	RATLC00037463	DS3	BUG9951: large paste of children too slow	nitind	7.0	IFix 001
3	RATLC00287304	DS3	BUG162321: Changing the encoding of the DTD file in the file properties has no effect	amyvnu	7.0	IFix 001
4	RATLC01104164	DS3	JSP SOURCE EDITOR FLAGS JSP TAG ATTRIBUTE AS UNRESOLVED AS YOU TYPE VALIDATOR DOES NOT PROPERLY RESOLVE THE ITEMS IN A TABLIB REFERENCE	nitind	7.0	IFix 001
5	RATLC01123651	DS3		nitind	7.0	IFix 001

Align development with operations

Publish and consume assets

Rational Asset Manager
Jazz

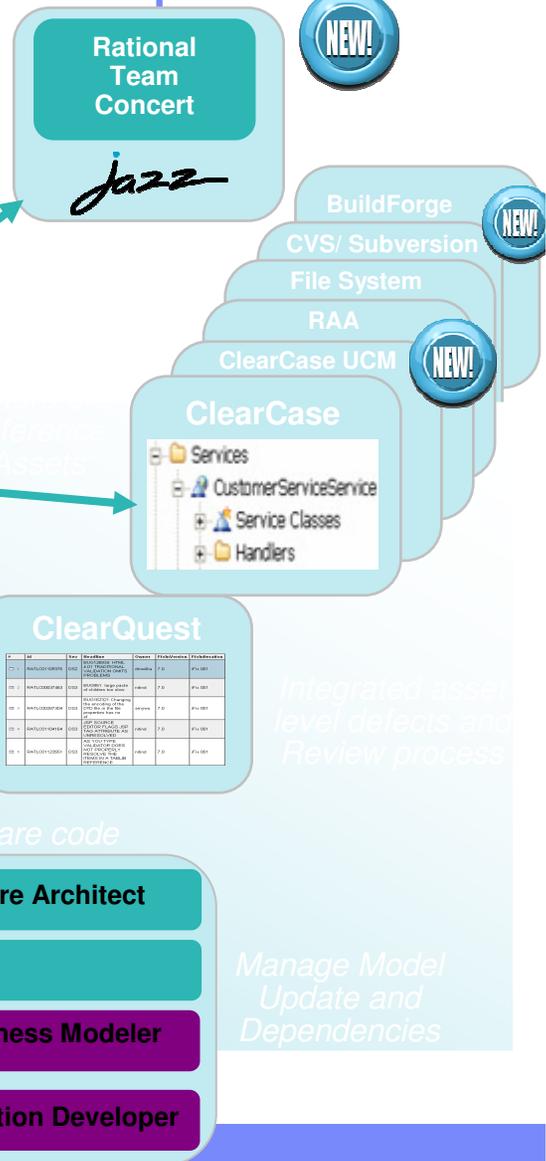
reference Assets

ClearQuest

Develop and share code

Integrated asset level defects and Review process

Manage Model Update and Dependencies

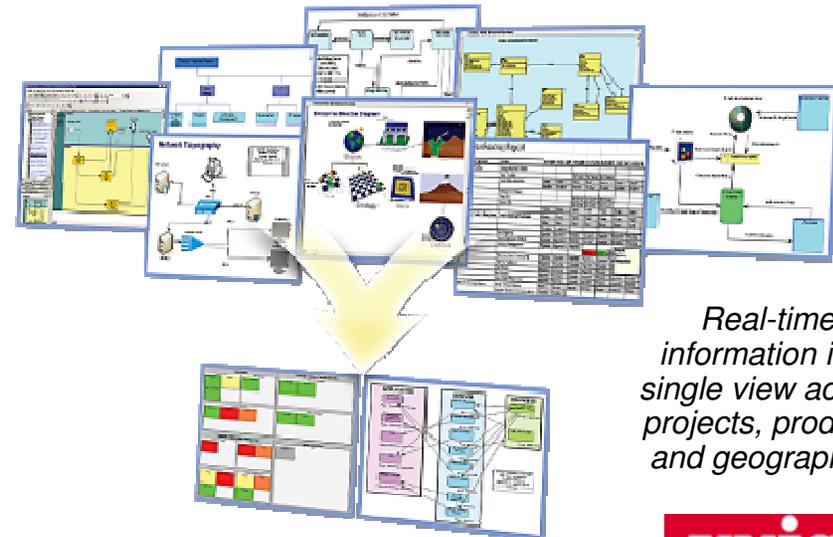


Enterprise reporting with Rational Insight



Automated project and process measurement can improve team productivity by 15%

- Monitor and analyze project and process performance
 - ▶ **Collaborate** across disparate development artifacts and in the context of operational and business objectives
 - ▶ **Automate** measurement leveraging an open RESTful and Jazz compliant data integration architecture
 - ▶ **Report** on relevant data with a built-in library of industry best practice metrics and dashboards
- Drive business innovation and reduce costs through measures and continuous **process improvement**
- Built on best in class business intelligence platform from IBM **Cognos**



Real-time information in a single view across projects, products and geographies

UNISYS
imagine it. done.

“Until now we were gathering metrics by manual methods. Rational Insight simplifies the presentation... Overall great tool to have for optimizing project efforts and giving management a birds eye view of the project performance at all stages.”



“Through the automation and dashboard capabilities in Insight, our team is saving over 40 hours a month on our reporting activities. We also can offer new capabilities such as “on-demand” dashboards which would have been very labor intensive to do without Insight”

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Applications: Better manage application architecture, reuse, and quality



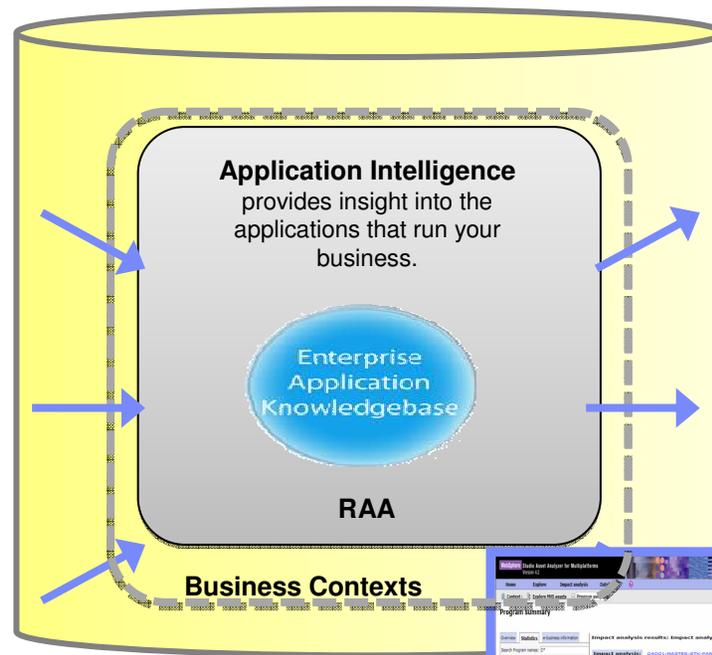
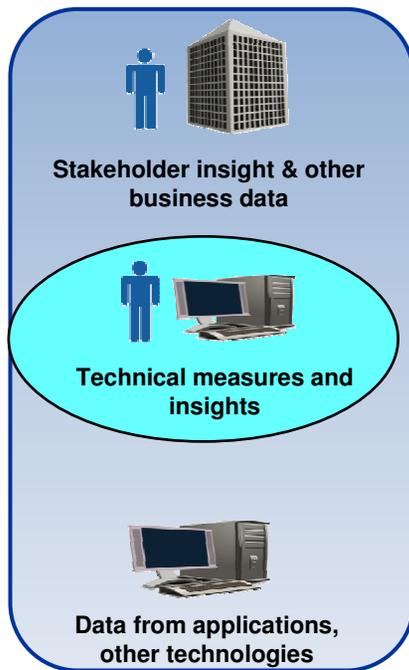
► Understand and extract value from existing assets

- Cut out years of accumulated dead code or redundant business logic
- Extract business rules from existing code for rewrite or reuse
- Refactor existing assets for reuse or migration

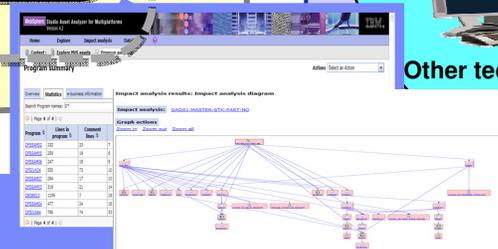
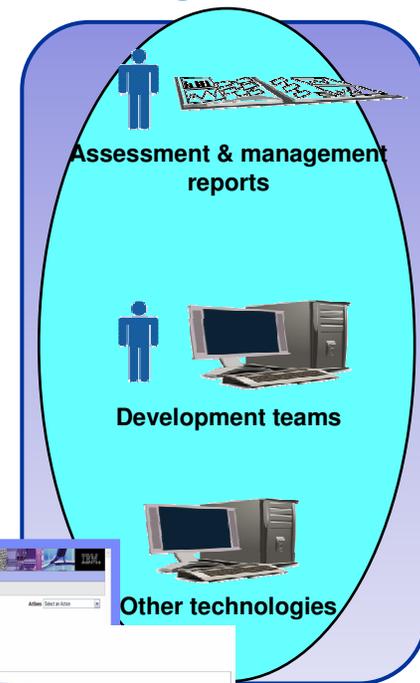
► Link application intelligence with business goals and IT systems

- Manage and make decisions based on the full portfolio – applications, assets, business rules, and services
- Extend application understanding to distributed platforms
- Provide customized portfolio dashboards based on role

Intelligence Feeds



Intelligence Users

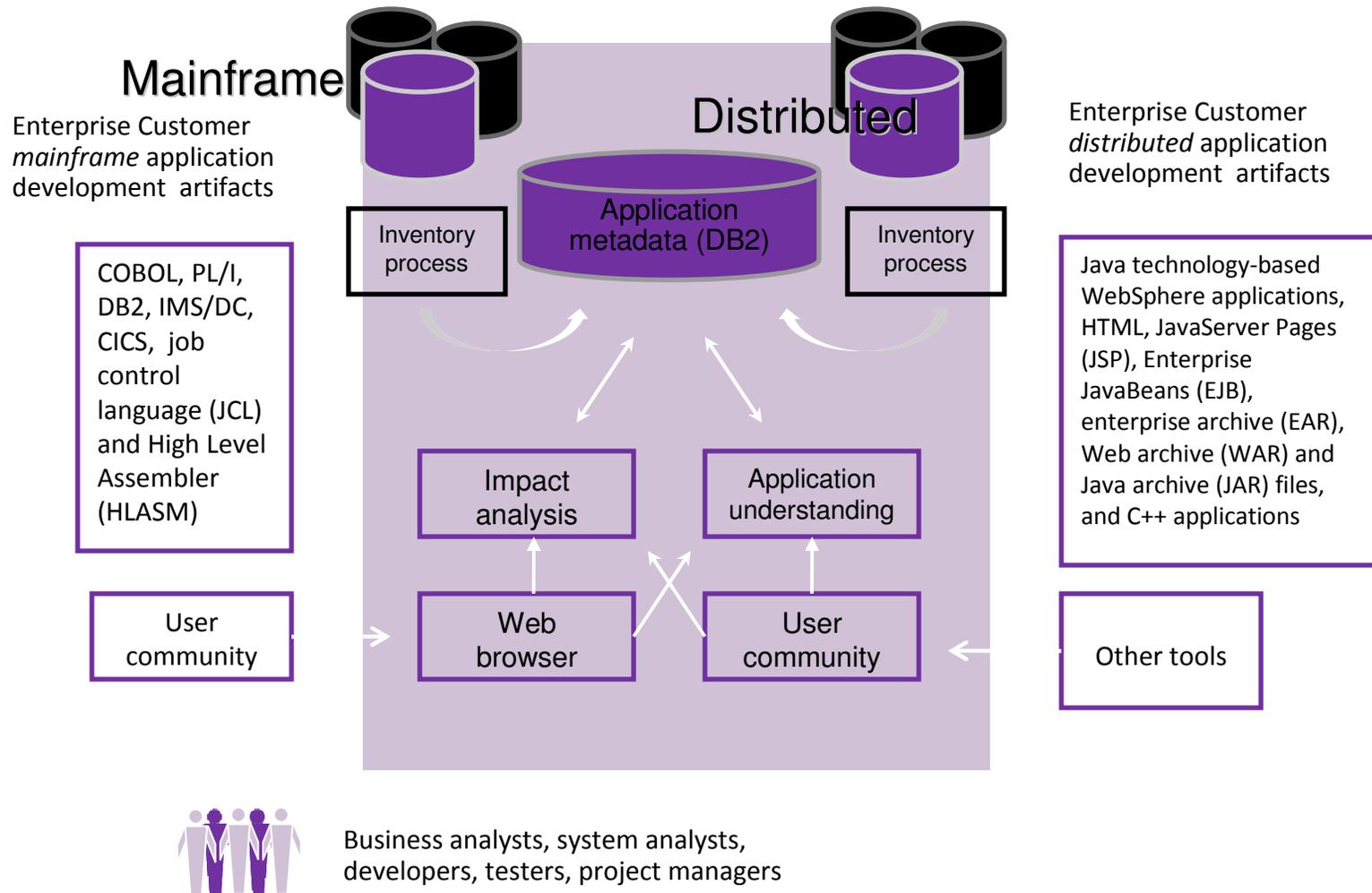


What is WSAA?

- Browser-based tool to accelerate the discovery and analysis phase in any new projects or maintenance efforts
- Support for System z, enterprise wide software applications
- Scans source “where it lives”
- Proven technology running on System z, Windows and AIX
- Assists in the development and test phases to identify impacts across the enterprise and identifying areas to test, thereby reducing risk and improving test coverage
- Identifies relationships among the artifacts
- Gathers metrics, counts related to the IT artifacts in the enterprise
- Provides a browser-based interface to search, explore and report on the gathered information

WebSphere Studio Asset Analyzer

Architectural View

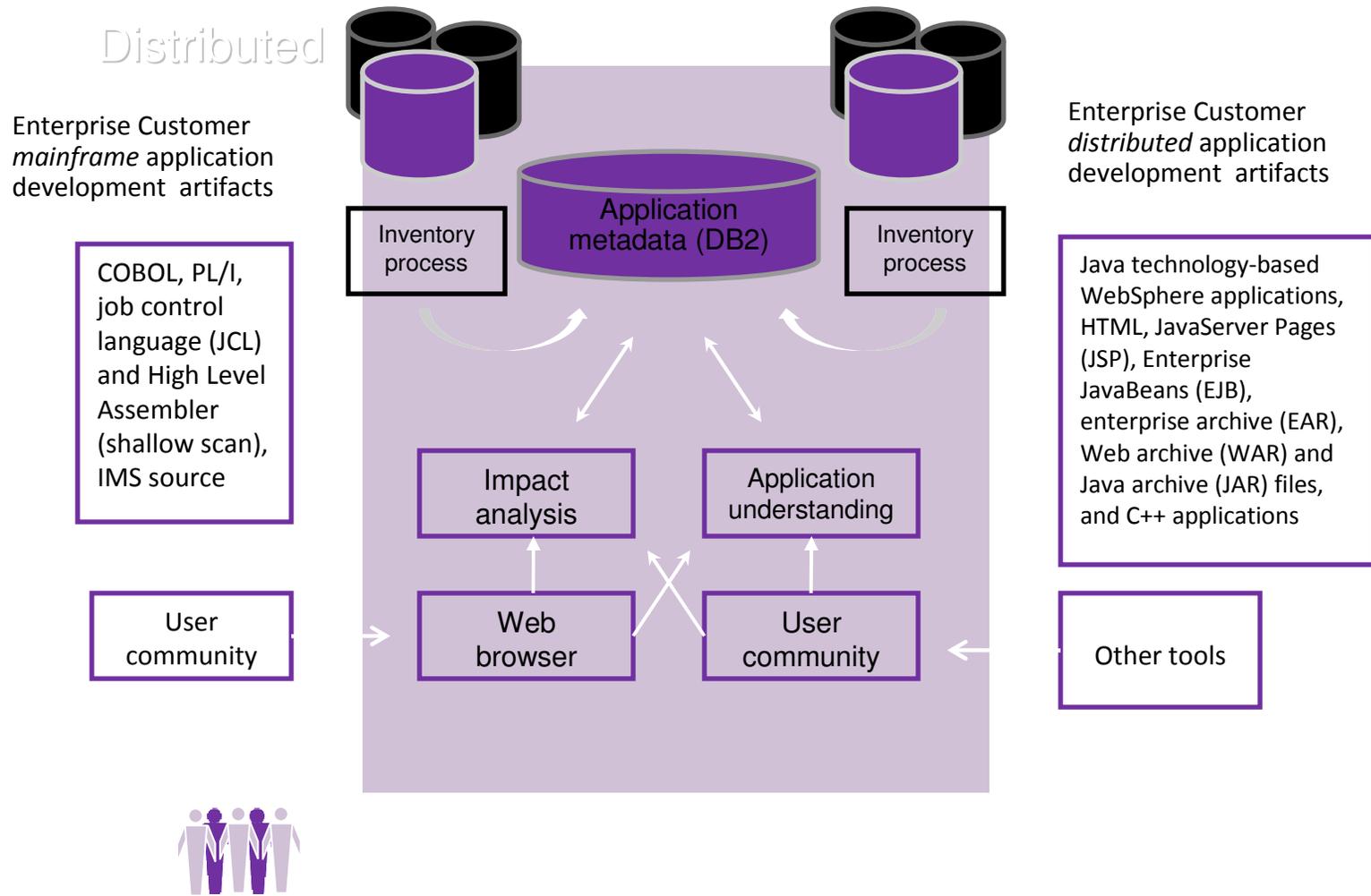


What is RAA?

- A sister product of WSAA
 - Based on proven WSAA technology
 - Support for the same languages/subsystems as WSAA
- Features similar to WSAA:
 - Windows-only solution
 - Ideal for small teams, quick ramp-up time
 - Supports System z and distributed source
 - Scans on the workstation
 - Client-server architecture, shared repository
- Additional Features:
 - Dashboards for counts & metrics
 - Ability to control depth of inventory scanning
 - Very fast directory scans to gather counts & metrics quickly
 - Eliminates need for DB2 on System z
 - RESTful API (documented in External Interface Guide)

Rational Asset Analyzer V5.5

Architectural View



Rational Asset Analyzer Key Benefits



- Reduce cost & risk of changes
 - ▶ Reduce duration of analysis related activities
 - ▶ Traverse relationships to determine how changes to data stores & data elements impact IMS transactions
 - ▶ Reduce time to determine scope and risk of change, whether for new enhancements or maintenance efforts

- Restore lost application knowledge, onboard new talent quickly
 - ▶ View diagrams such as the IMS transaction diagrams to quickly get a handle on which PSBs, segments, DB2 tables and segments are referenced
 - ▶ Example reports:
 - List all IMS transactions, IMS subsystems and batch jobs that use a PSB
 - List all the IMS subsystems and PSBs that use a DBD
 - List all CICS transactions, programs, files/DB's
 - List all Batch jobs, programs, files/DB's

Rational Asset Analyzer

Home Explore Impact analysis Database ?

IMS transaction diagram

IMS transaction: [DSN8CS](#)

Graph actions
[Zoom in](#) [Zoom out](#) [Zoom all](#)

DSN8CS

DSN8IC0

PSB DSN8IC0 PARTROOT VCONA VDEPT VDSPTXT VEMP VOPTVAL DBD DSN8IC00 DSN8IC00 TERMINAL

Rational Asset Analyzer

Home Explore Impact analysis Database ?

Context : [Home](#) [Impact analysis summary](#) [Impact analysis details: Impact analysis results](#)

Impact analysis details: Impact analysis results

Details

Impact analysis:	PARTINV:PART-NO
Description:	GENERATED for Program PARTINV, Data element PART-NO
Starting points for the impact analysis:	Program/Element: PARTINV/PART-NO
Scope of analysis:	<unlimited>
Levels of impact analyzed:	<unlimited>
Created/last updated:	2009/05/05 02:27:14 PM by DB2ADMIN / 2009/05/05 02:27:16 PM by DB2ADMIN

Overview [Summary](#) [Details](#) [Metrics - overview](#) [Metrics - detailed](#) [User-related assets](#)

The following impact analysis overview diagram shows a subset of assets that this proposed code change directly and indirectly affects.

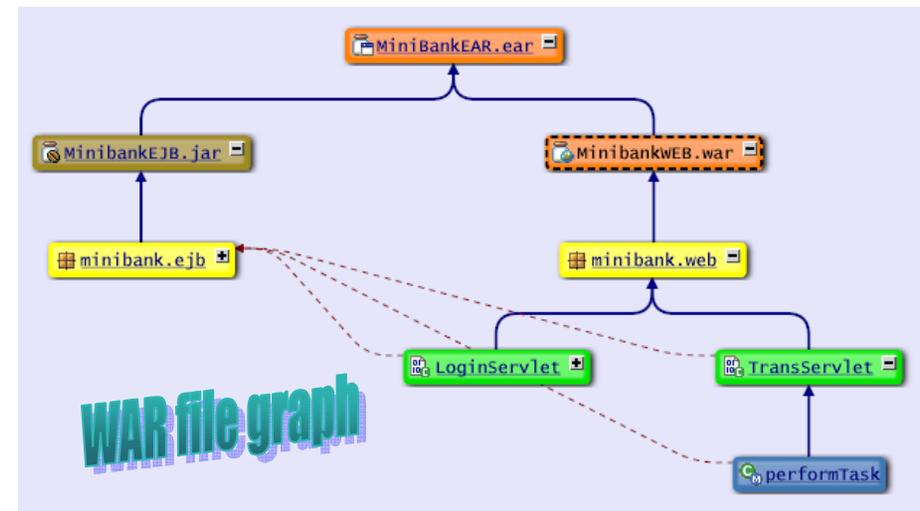
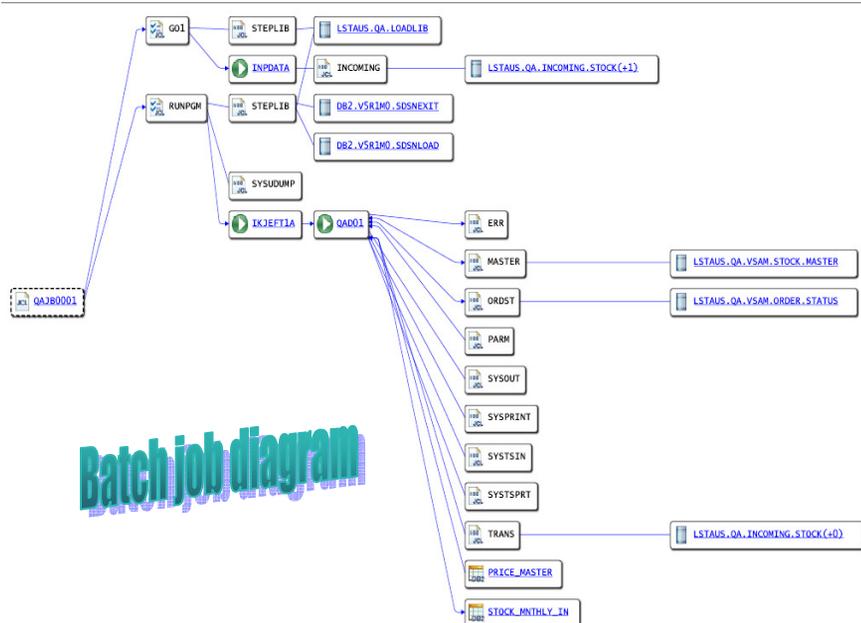
```

graph TD
    A["0 CICS transactions  
0 IMS transactions"] --> B["Direct Impacts"]
    C["1 Batch jobs"] --> B
    D["0 CICS transactions  
0 IMS transactions"] --> E["Indirect Impacts"]
    F["0 Batch jobs"] --> E
    B --> G["Starting with 1 data elements  
in 1 programs  
1 Data elements  
0 Entry points  
0 Other impacted programs"]
    G <--> H["0 Data sets  
0 Data stores  
1 IMS segments  
0 DB2 tables"]
    H <--> I["0 Data elements  
0 Programs"]
    E --> I
  
```

Rational Asset Analyzer – Application Understanding

Quickly understand code with little or no documentation, and relationships across the enterprise

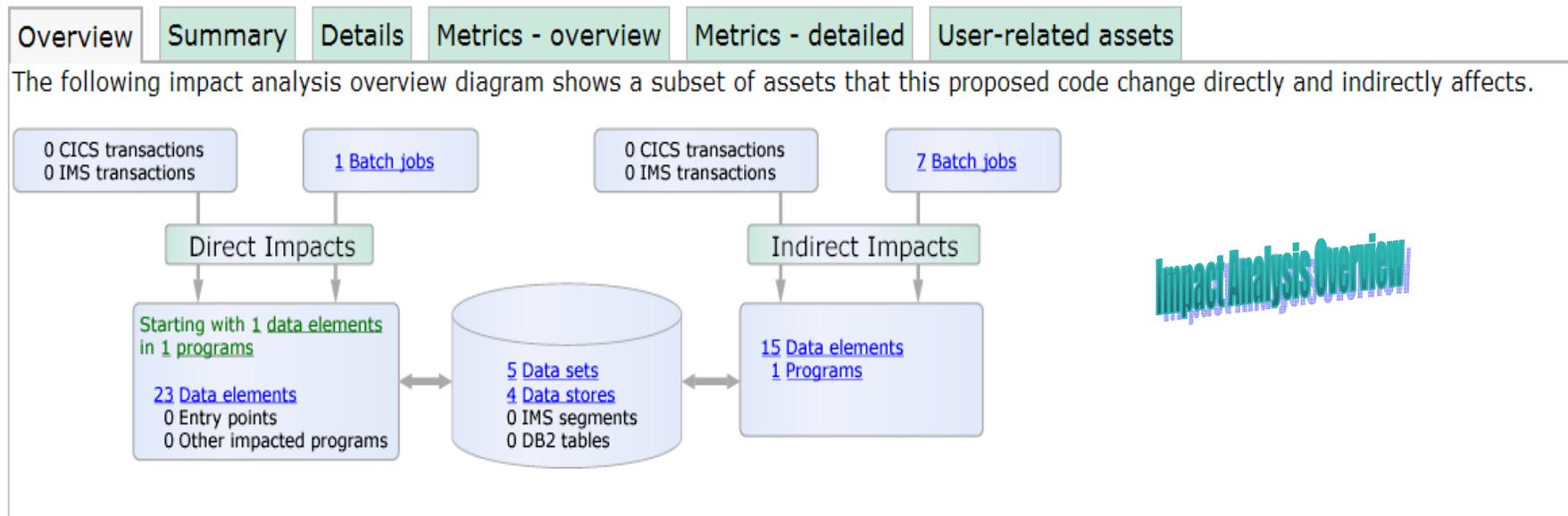
- Group artifacts into **user-defined groups** called Applications to limit scope to area of interest
- Use **various types of diagrams** for understanding how the application “hangs together”
- Use **annotations** to capture knowledge from SMEs e.g. Business function, description, etc.
- Create **user-defined relationships** for situations where relationships cannot be determined through static analysis
- Perform **enterprise-level keyword searches**



Rational Asset Analyzer – End to End Impact Analysis

Reduce time to market & risk of downtime by understanding change impact upfront

- Reduce time to determine **scope of change** whether for new enhancements, or even maintenance efforts
- View the metrics for impacted artifacts to determine the **risk of change** i.e. cyclomatic complexity, lines in file, etc.
- Traverse user-defined relationships to determine **impacts across platforms** i.e. follow dependencies from mainframe to J2EE and back.
- Create a **bill of materials**” of impacted artifacts by evaluating the details page



Rational Asset Analyzer – Extensible Framework

Tailor RAA to your organization's needs

- Access RAA's wealth of information using standard **web services**
- Add the support for languages not currently supported using RAA's documented **import file format**
- Extend RAA with **user-defined metrics & counts**
- Create **custom queries** and optionally include them as actions on pages
- Create your own Web 2.0 applications and access RAA information using RAA's **REST interface**

Database Tables, by name

The DB2 tables created by Rational Asset Analyzer are listed in alphabetical order. Not all of these tables are for reference only and are subject to change. They do not constitute a programming interface.

Table name	Type	Model	Submodel
DMH_ACTIVITY_LOG	Table	System	Activity log
DMH_ACTUAL_PARM	Table	Logical assets (MVS)	Compile unit parameter
DMH_ANALYSIS_QUEUE	Table	System	Analysis queue
DMH_APPLICATION	Table	System	Application
DMH_APPL_CLOSURE	Table	System	Application
DMH_APPL_CMPNT	Table	System	Application
DMH_ARCHIVE	Table	Logical assets (Distributed)	Archive
DMH_ARCH_MANIFEST	Table	Logical assets	Archive manifest

Import file description

[DMH:](#)

[DMH:](#) The input file, which must reside on the server machine, is a text file with fixed format records. Each record contains an identifying record type followed by one or more attribute fields (separated by at least one space).

[DMH:](#)

[DMH:](#) For the import process to work correctly, the order of the text file records is important. The following lists outline the appropriate order for these records:

Record type: identifies

- [FMT](#): the import file's format
- [TOOL](#): the import file's origin
- [SITE](#): the site (or server) name to associated with any subsequent import records
- [APP](#): the Application owner for components that follow
- [LIBR](#): a container
- [MEMB](#): a file
 - [ATTC](#): a character attribute
 - [ATTN](#): a numeric attribute
 - [incl](#) (format 1): identifies an included source file
 - [msg](#): identifies the text of a message

Rational Asset Analyzer – Scalability

The ability to start small and scale up to enterprise-wide usage

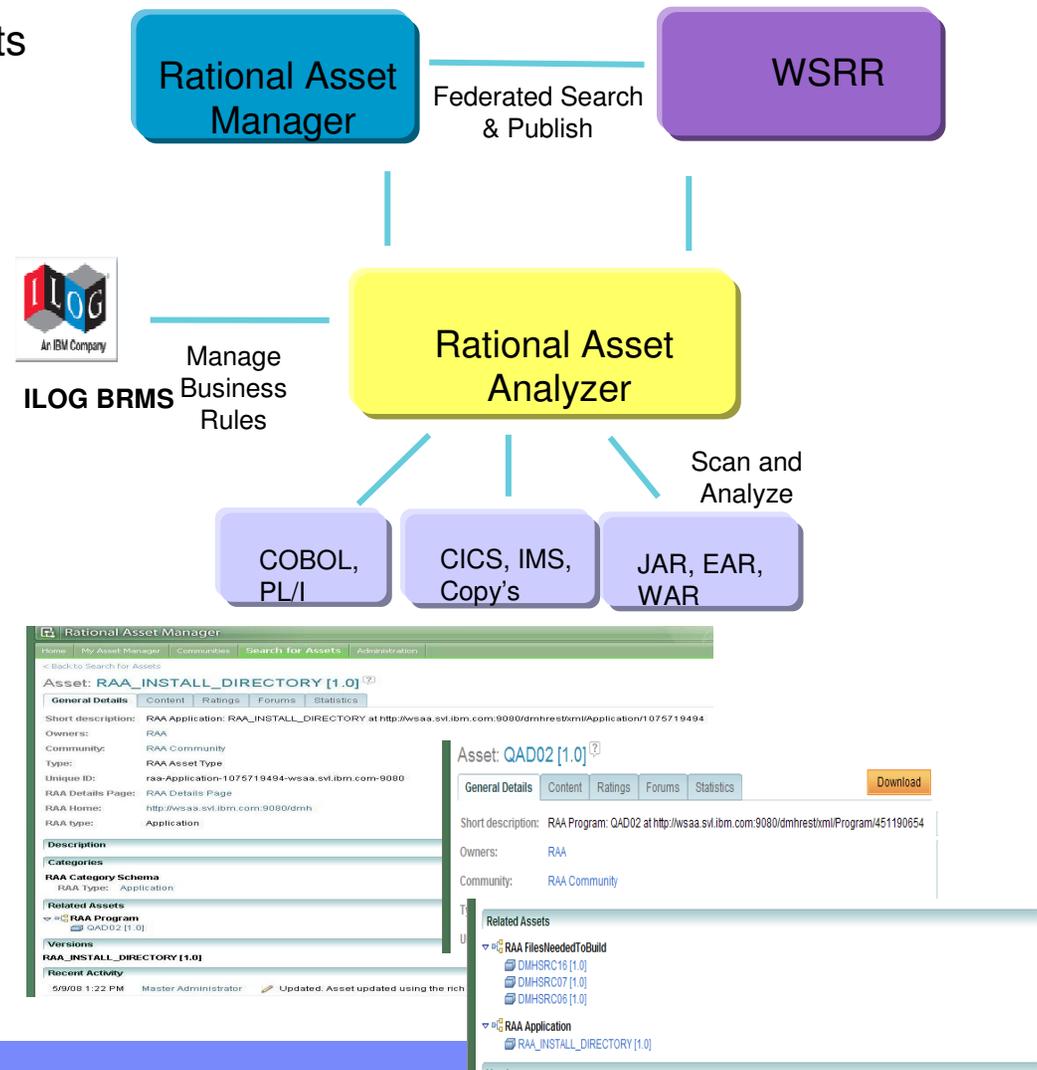
- RAA is built on the **highly scalable** Websphere Application Server and DB2 products
 - *It has the potential to handle hundreds of millions of lines of code **
- You have the flexibility to start with a small team (10-15 users), or scale up to handle source of the entire enterprise *
- Since RAA is browser-based, **administration costs are minimized**
 - *Client machines do not need to be managed & updated*
 - *Scaling up is as simple as giving additional users access*



Applications: Extend Reuse to Mainframe & Web

By Bridging Gap between Assets, Services & Transactions

- Gain clarity on application portfolio, assets and services
- Publish and manage assets across organizations
- Discern application impact of services and underlying processing
- Discover & reuse hidden business rules buried in complex applications



Mine business rules from existing artifacts

Rules business or regulatory driven parameters that applications programmatically support

- The business rule is written at the atomic level to represent a single business intent representing a single function. Since legacy systems are usually complex, however, the business rules may be at varying levels of granularity.
- The business rules embody the formal intent of a business, legal or regulatory request in English language. We call that a Business Policy
- Typically, business rules are logically grouped and managed as a single entity called a Rule Set
- Business Policy's are made up of one or more Rule Sets. Rule Sets can be shared between business policy's

* From GBS – SWG meeting April 24, 2008 (Application Modernization – Tools and Methods for Application Understanding)

COBOL	JRules/RFC
IF ORPOU343-TPR > 10000	Calculate discount – type A
IF ORPCT267-TPA	<i>if</i> the total price of 'the order' is more than 10000 and the type of 'the client' is A
COMPUTE ORPOU343-DPC = ORPOU343-DCF * 0.25	<i>then</i> calculate discount for type A client; show result;
ELSE IF ORPCT267-TPB	Calculate discount – type B
COMPUTE ORPOU343-DPC = ORPOU343-DCF * 0.15	<i>if</i> the total price of 'the order' is more than 10000 and the type of 'the client' is B
ELSE IF ORPCT267-TPC	<i>then</i> calculate discount for type B client; show result;
COMPUTE ORPOU343-DPC = ORPOU343-DCF * 0.10	Calculate discount – type C
END-IF	<i>if</i> the total price of 'the order' is more than 10000 and the type of 'the client' is C
END-IF	<i>then</i> calculate discount for type C client; show result;
END-IF	
DISPLAY "Customer number: " ORPCT267-CNU	
DISPLAY "Customer: " ORPCT267-CLN	
DISPLAY "Customer type: " ORPCT267-CTY	
DISPLAY "Discount: " ORPOU343-DPC	
END-IF.	

Subject Matter Expert (SME)
Ensure proper understanding during preparation phase and validation phase

Rule Mining Expert (RME)
Formulate and adapt rule mining methodology and help discover the rules

RAA Expert (RAA)
Develop and execute queries to find business rules during discovery phase

JRULE Expert (JRULE)
Ensure integrity and consistency of rule(s) and record them in JRule tool

R
A
A

J
R
U
L
E

Preparation
Insure correctness and completeness

- Source inventory
- List of terms in focus
- Criteria for valid business rules

Discovery
Search for business rules

- Map business to technical terms
- Search across artifacts
- Follow linkages / paths

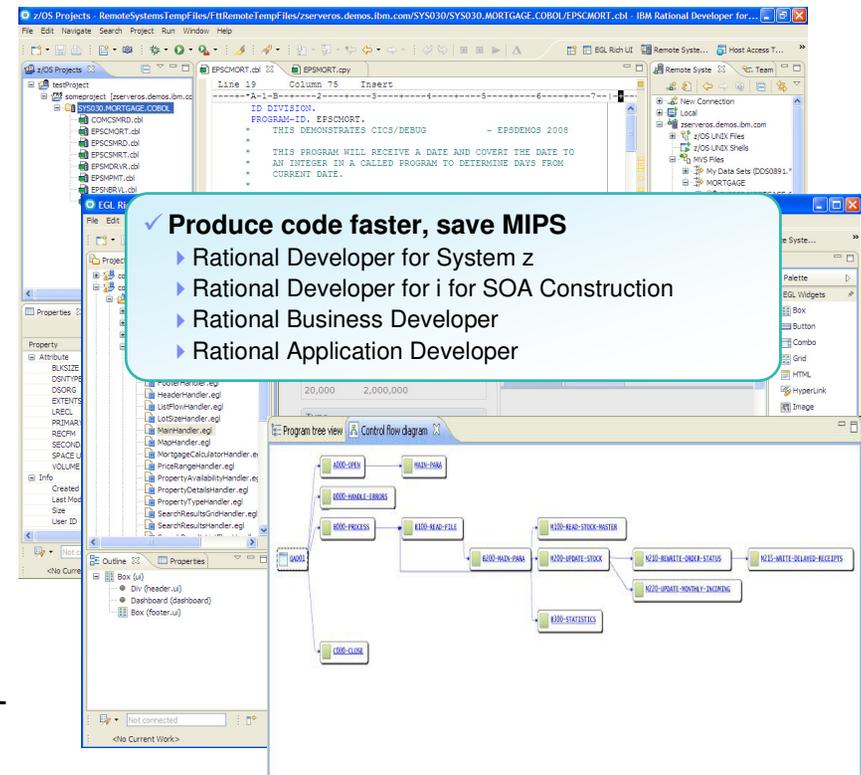
Validation

- Verify correctness
- Verify coverage
- Record and migrate to JRule

Integrate understanding with modern IDEs

Improve developer productivity & reduce costs through speeding understanding

- Use common Eclipse-based tooling across multiple platforms and languages
 - ▶ Achieve ~15% improvement in System z developer productivity¹
 - ▶ Reduce host CPU usage 50%-80%¹ with workstation syntax checking
 - ▶ Reduce training costs, more attractive IDE for younger developers
- Speed development with specialized editors and code generation wizards
 - ▶ Code assist for COBOL, PL/I, C/C++, EGL, RPG, Visual editors for BMS and MFS maps
 - ▶ Generate code from UML
 - ▶ Generate web services from stored procedures or SQL
 - ▶ Analytics for COBOL

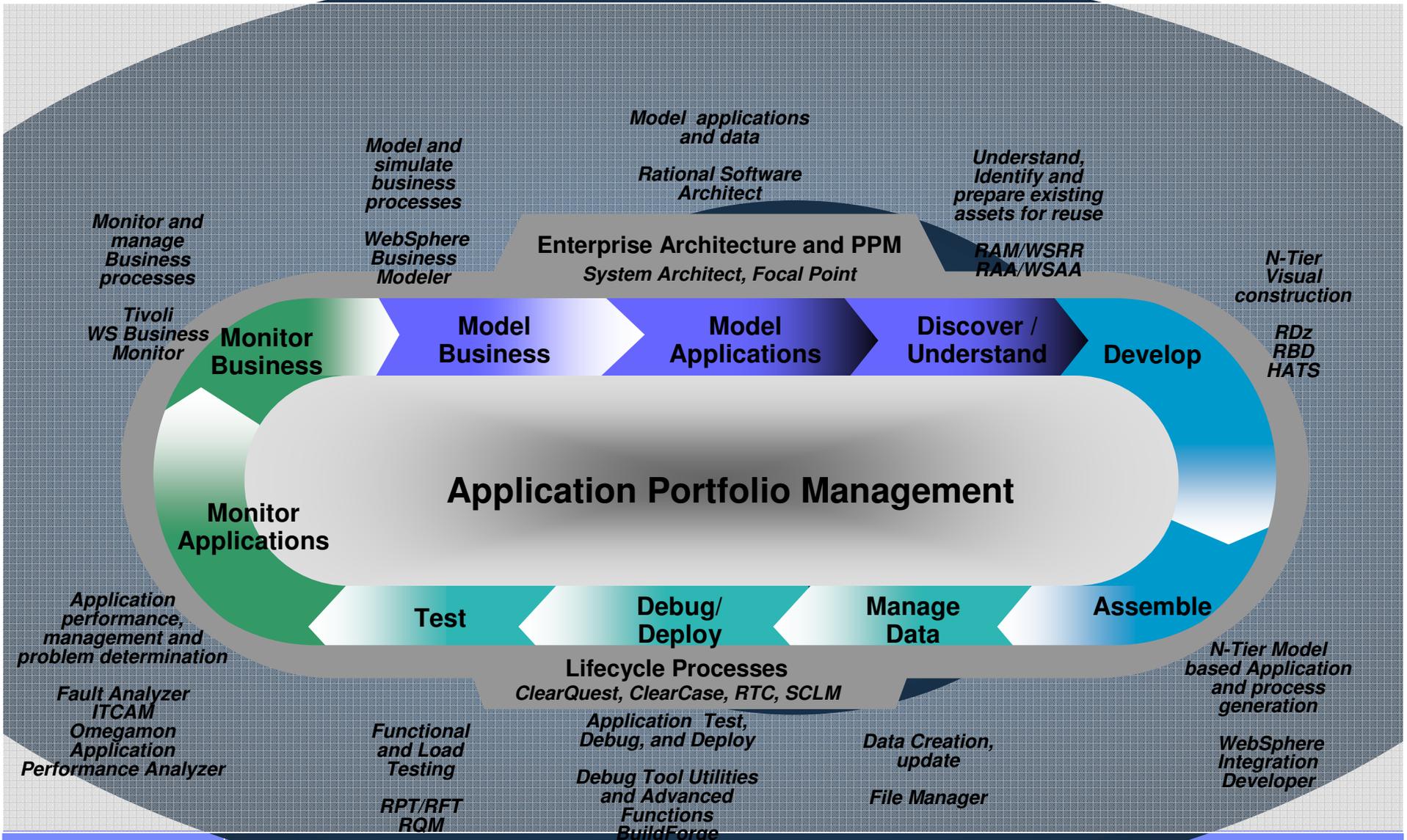


“RDz offers a uniform, open programming environment for both J2EE and PL/I developers. RDz accelerates PL/I development with its local syntax checker and debugging tool.”

Dr. Axel Lömker, KfW Bankengruppe



APM and the Application Lifecycle

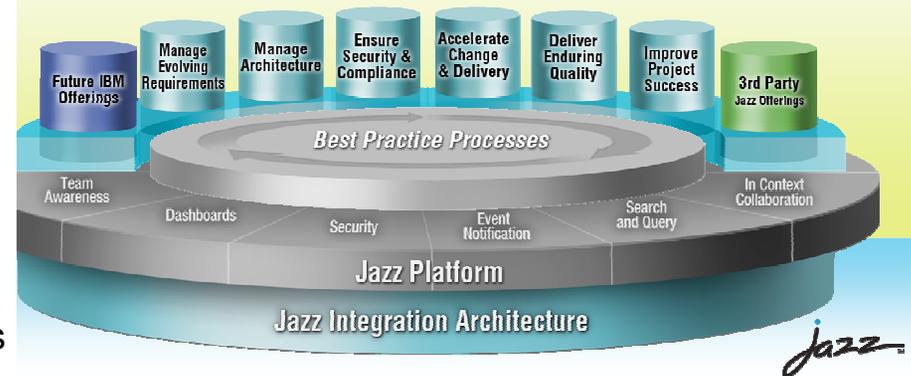


Improve cross-organizational deliveries

Govern & collaborate end-to-end



- Collaborate in context across all platforms and geographies
 - ▶ Make software development more automated, transparent and predictable
 - ▶ Think and work in unison with integrated source control, work item and build management
- Assess real-time project health
 - ▶ Capture data automatically and unobtrusively
 - ▶ Measure & report progress against project and business objectives
- Automate best practices
 - ▶ Accelerate team workflow with dynamic processes
 - ▶ Leverage out-of-the-box or customized processes



"Where we previously used separate systems, with Rational Team Concert we now have well integrated functionality. Our developers are more efficient because they are better able to focus on important issues. Our project managers greatly value the ability to customize these dashboards and instantly provide status on their milestones!"

--Mika Koivuluoma - Production Manager, TietoEnator

Thank
you

