IBM Software Group

SHARE Anaheim 2011
Session 9076
Application Analytics
Knowledge is Power

2 March 2011

Richard Szulewski
Rational Product Manager – Application Portfolio Mgmt
rszulews@us.ibm.com

Go to IBM

© 2011 IBM Corporation

Abstract

Do you know what your business solution is made of? Do you know what applications are in use and what data they create and/or use? Do you know what languages are in use?

Accurate and detailed application knowledge is critical when you need to touch them for reuse, for modernization, and for just plain maintenance. Regardless of why you need to touch the applications or the data, knowing how the applications interact and how complex they are will have a major impact on the time, resources and cost of that touch. This knowledge will also define the skills you need to maintain on your teams or find in the marketplace.

Terminology

Knowledge, from Merriam-Webster

- A (1) : the fact or condition of knowing something with **familiarity gained through experience** or association

  (2) : acquaintance with or understanding of a science, art, or technique

- B (1) : the fact or condition of being aware of something

  (2) : the range of one's information or **understanding** <answered to the best of my knowledge>

- C : the circumstance or condition of apprehending truth or fact through reasoning : cognition d : the fact or condition of **having information** or of being learned <a person of unusual knowledge>

Terminology

Power, from Merriam-Webster

- 1 a (1) : **ability to act** or produce an effect
  (2) : ability to get extra-base hits
  (3) : capacity for being acted upon or undergoing an effect
- 1 b : legal or official authority, capacity, or right
- 2 a : **possession of control, authority, or influence** over others
- 2 b : one having such power; specifically : a sovereign state
- 2 c : a controlling group : establishment —often used in the phrase the powers that be

What do you need to understand in order to be able to act?

- What you have?
  - How much of what
    - Counts
    - Languages
    - Element types – Program, File, JCL, Transaction, Data Element, etc
  - Complexity – Fragility - Difficulty
- How are the elements related?
  - Synonyms
  - Execution flow
  - Relationships and interdependencies
  - Build dependencies
- How are the elements used?
  - Run units
  - Batch, transaction, included element

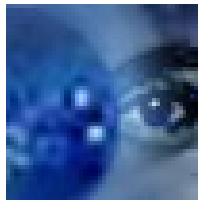
Knowledge Accuracy, Persistence and Currency

- Accuracy
  - Fact based rather then recollection or hearsay
  - Detailed to the level of use
    - Program level for Architecture
    - Statement/Element level for change impact, rule mining, etc

- Persistence
  - Retained in a shared accessible repository
  - Accessible through a diversity of methods
  - Retention/Recovery policies akin to any other critical business asset
- Currency
  - Knowledge needs to map to a know application set
  - Knowledge needs to track changes to the application set

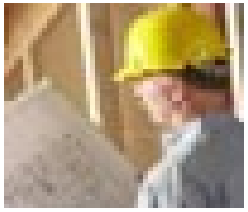
Knowledge Access Enabling Action

- Analyst, Management, Stakeholder
  - Interactive, Ad-hoc – Web Access
    - Free form navigation via hot links
    - Enhanced with Tab – New Page Browser constructs
    - Extensible pages to customize knowledge displayed
  - Programmatic, data extraction for reuse – RESTful API
    - Share knowledge with other tooling
    - Facilitate regular reporting and dashboard
- Developer Practitioner
  - Integrated Development Environment – Eclipse
    - Integrate knowledge details into Developers “workspace”
    - Access potentially multiple knowledge bases

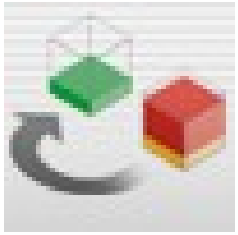


Acting on the Knowledge

- Application Investment Planning
  - Accurate description of the application set
    - How much of what and in what condition

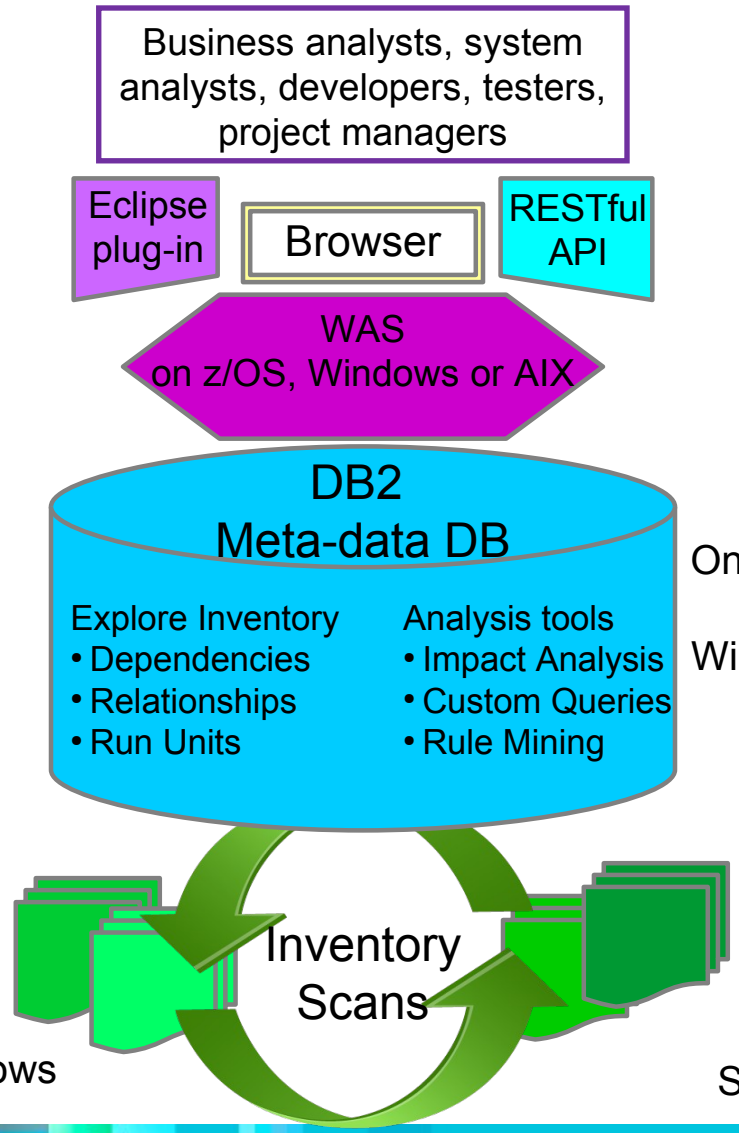


- Application Development Project Planning
  - Impact of “touching” any given element within the set
  - Risk of the change based on the complexity/fragility of the elements
  - Accurate project scope – leading to more on plan delivery
- Application Build
  - Build just what you need
  - Build everything that you need, each time



- Application Test
  - Test just what you need
  - Test everything that you need to test

Asset Analyzer Family Architecture



Integrated Development Environment
- Integrating analysis with coding tools
  - Integrated views
  - Web View

- Companion tool integration
  - Dashboards
  - Portfolio Analysis
- Business tools extracts
  - Documents
  - Spreadsheets

On z/OS or Windows

COBOL, PL/I applications for CICS, IMS and DB2 plus z/OS Job Control Language (JCL) and High Level Assembler

Scannable on z/OS or Windows

Java technology-based applications, HTML, JavaServer Pages (JSP), Enterprise JavaBeans (EJB), enterprise archive (EAR), Web archive (WAR) and Java archive (JAR) files, and C/C++

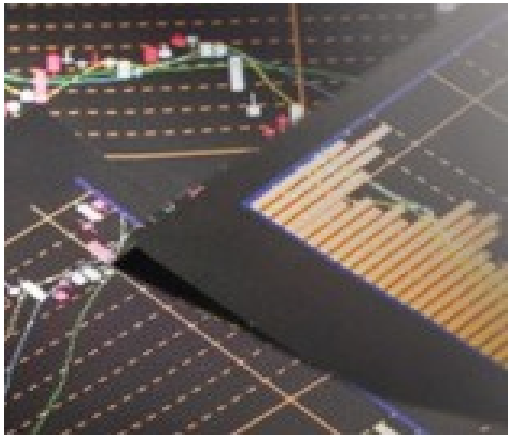
Scannable on Windows or AIX

What do we end up with?

- Shared electronic knowledge base
  - Organized and persisted inventory of artifacts, files, and subsystem resources
    - Linked to the actual application source assets
  - Accessible by analyst and practitioner
    - Web and Eclipse
  - Knowledge extractable/integrable with broad set of tooling
    - via RESTful API
- Flexible analysis tool
  - Supports Subject Matter Experts with factual information
    - Visualization of architectures and artifacts
    - Code Understanding
    - Sophisticated change impact analysis
  - Dashboard for counts and metrics
  - Repeatable analytics available to all
  - Mitigates impact of personnel or skill “shifts”s

Essential Business Asset

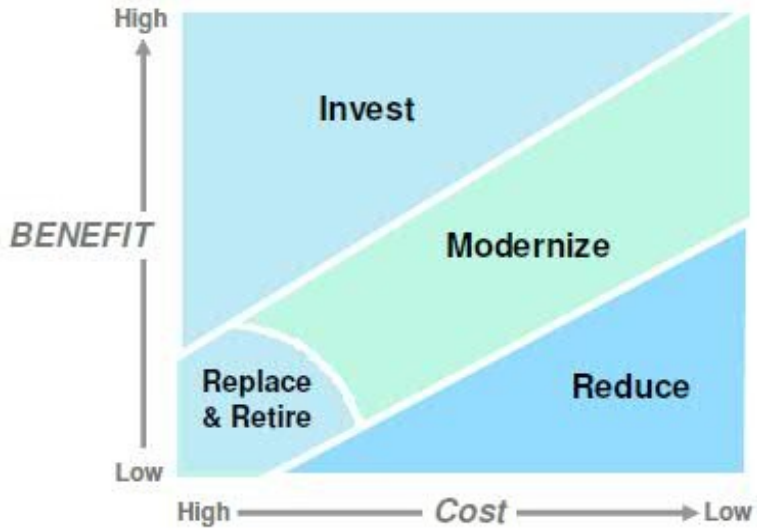
- Fact based description of application assets
- Basis for making application project plans
  - More cost effective
  - Less business risk
  - More likely to complete on time and budget
- Essential input to Application Portfolio Management processes



Strategic Plan for Modernization Initiatives

- Establish a ***consolidated view*** of business priorities, applications and infrastructure to drive strategic portfolio transformation
- Identify problems and opportunities to ***reduce maintenance costs*** that are ruining your IT budget
- Build a ***roadmap for transformation,*** setting the course to:
  - Remove high cost, low business value applications
  - Modernize applications with high value
  - Invest in critical business areas that are under supported

Total Economic Impact Assessment Methodology



Source: Phil Murphy, Principal Analyst, Forrester Research, March 2009.

"… enterprise planning enables us to better visualize and compare our current environment with our future goals and visualize the journey between the two."
Dave Keifer
Enterprise Architect
Christiana Care Health System

What is Rational Asset Analyzer?

An application understanding tool

- Improved project effectiveness, with reduced risk and improved productivity
  - Gather complexity metrics across multi-platform applications
  - Determine the application structure and key relationships
  - Identify scope and impact of pending application or database changes

- Role Oriented User Interface
  - Developer-oriented Eclipse user interface integrated with RDz
  - Easy-to-use browser interface for search, exploration, dashboard and construction of complex queries

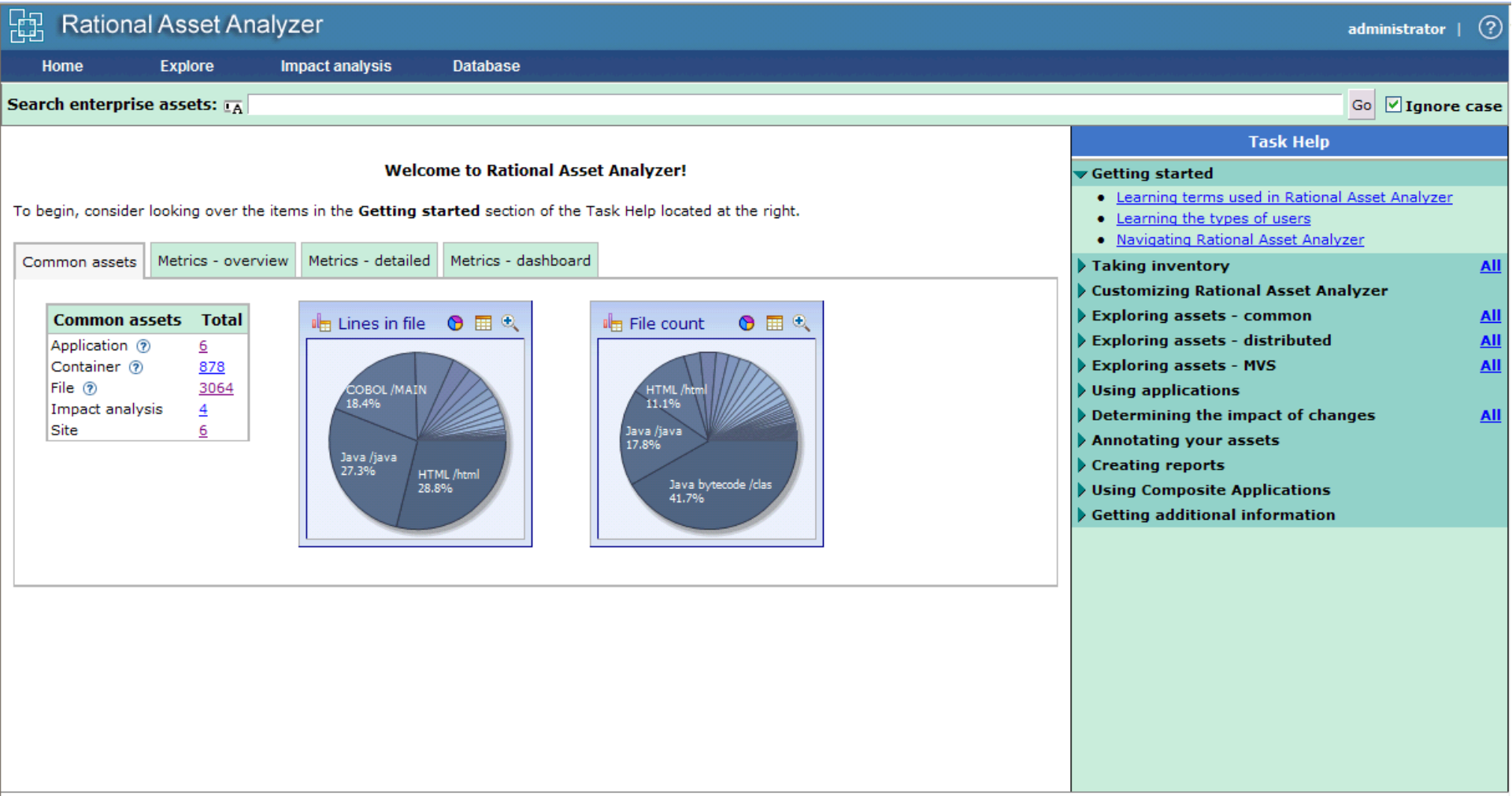
- Comprehensive repository built on DB2
  - Accessible via RESTful interfaces
  - Data schema is documented
  - Enabled for Rational Insight dashboard integration

- Fundamental to business decision making solutions
  - Provides business rule identification in source code inventory
  - Enables business rule capture and management with WebSphere ILOG BRMS

- Platform-specific editions available
  - Rational Asset Analyzer – Windows server-based with z/OS access
  - Rational Asset Analyzer for System z – z/OS server-based with Windows and AIX access

Rational Asset Analyzer – Application Understanding

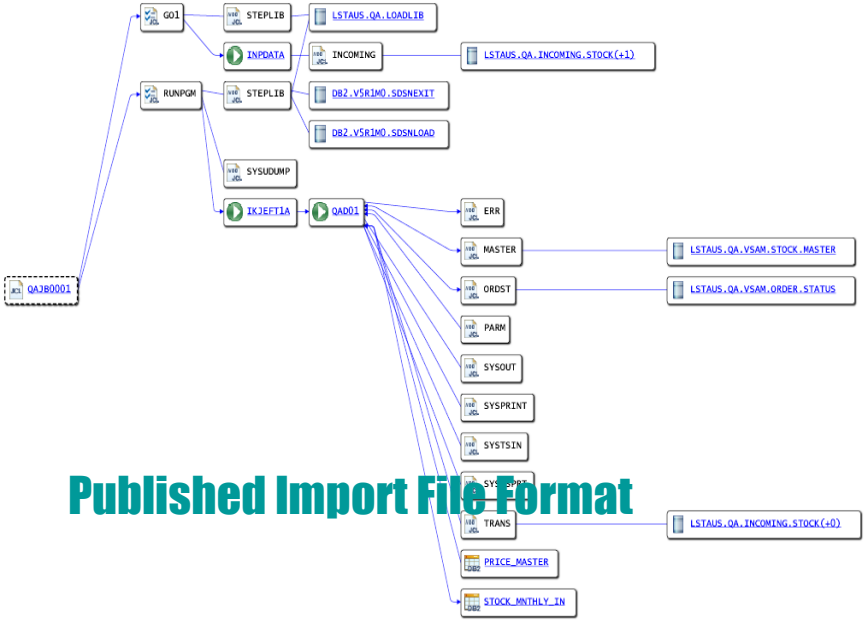
Factual, practical, source code based metrics



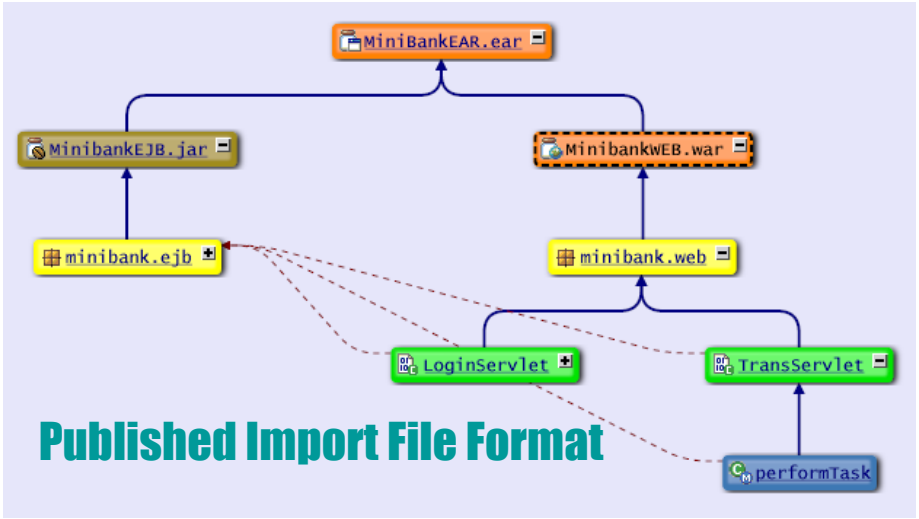
Rational Asset Analyzer – Application Understanding

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"



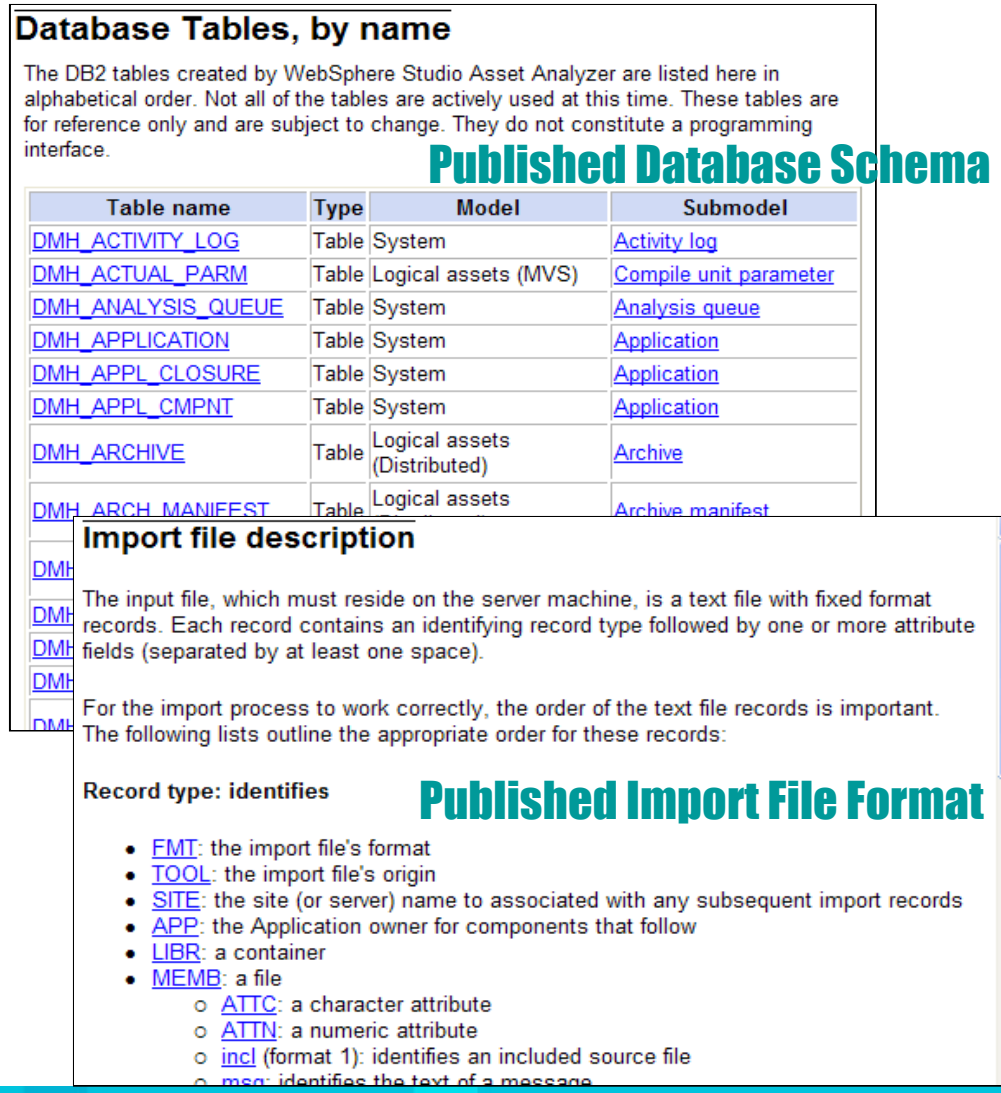
- Use **annotations** to capture knowledge from SMEs e.g. Business function, description, etc.
- Create **user-defined relationships** for situations where relationships cannot be determined through static analysis
- Perform **enterprise-level keyword searches**



Rational Asset Analyzer – Extensible Framework

Tailor RAA to your organization's needs

- Create **custom queries** with the look and feel of RAA's GUI.
- Use as **integration point** for other organization information by adding tables and queries to RAA.
- Access RAA's wealth of information using RAA's **REST interface** to create your own Web 2.0 applications.
- Extend RAA with **user-defined metrics & counts**
- Add the support for languages not currently supported using RAA's documented **import file** format



Database Tables, by name

The DB2 tables created by WebSphere Studio Asset Analyzer are listed here in alphabetical order. Not all of the tables are actively used at this time. These tables are for reference only and are subject to change. They do not constitute a programming interface.

Published Database Schema

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

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).

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

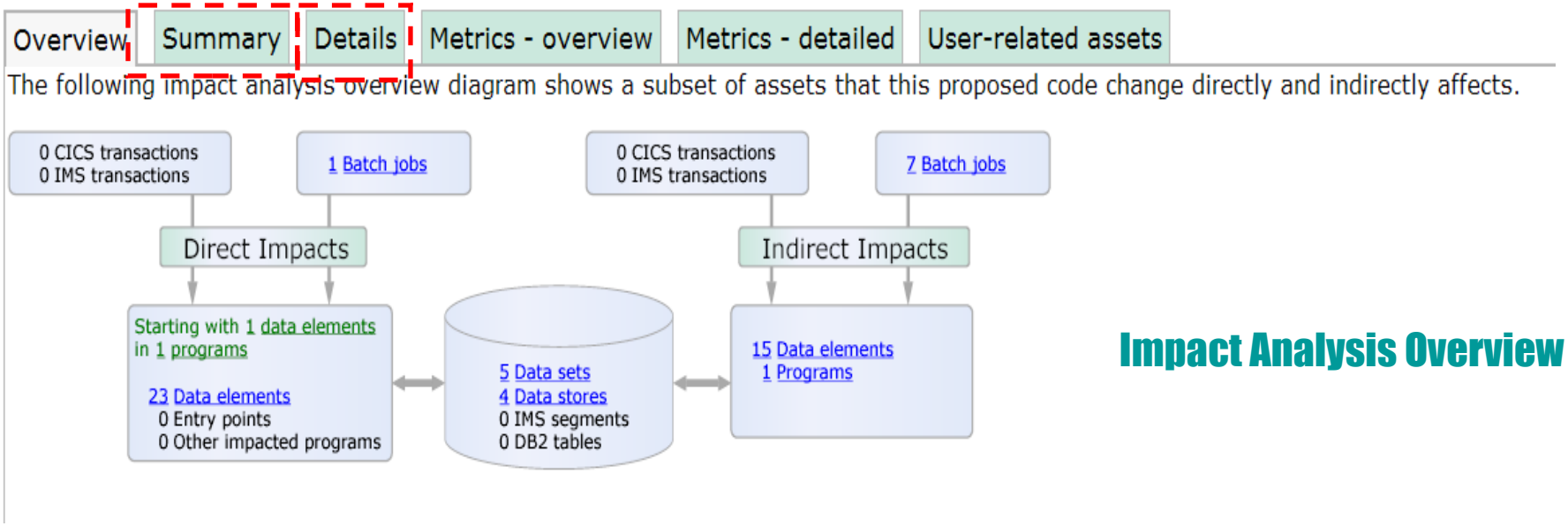
Published Import File Format

- 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 – End to End Impact Analysis

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

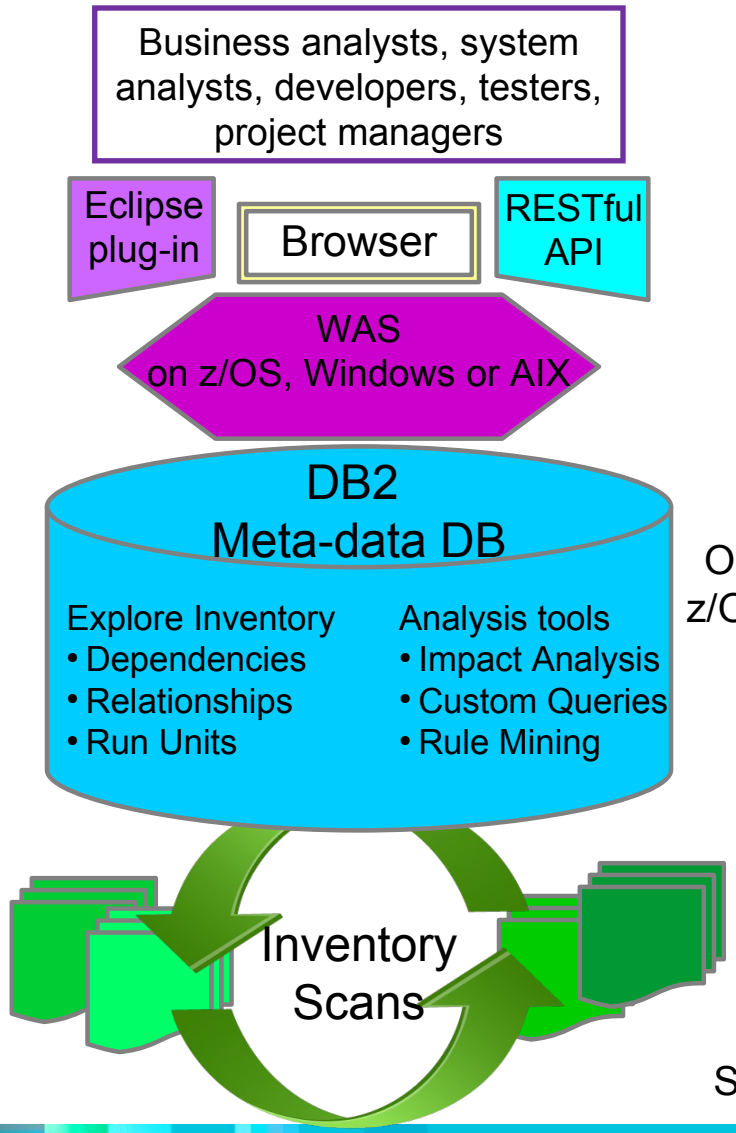
- Reduce time to determine **scope of change** whether for new enhancements, or even maintenance efforts
- View the metrics for impacted artifacts to determine the **risk of change** i.e. cyclomatic complexity, lines in file, etc.
- Traverse user-defined relationships to determine **impacts across platforms**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



Impact Analysis Overview

Rational Asset Analyzer for System z Architecture

Integrated Development Environment
- Integrating analysis with coding tools
  - Integrated views
  - Web View



On z/OS

- Companion tool integration
  - Dashboards
  - Portfolio Analysis
- Business tools extracts
  - Documents
  - Spreadsheets

COBOL, PL/I applications for CICS, IMS and DB2 plus z/OS Job Control Language (JCL) and High Level Assembler

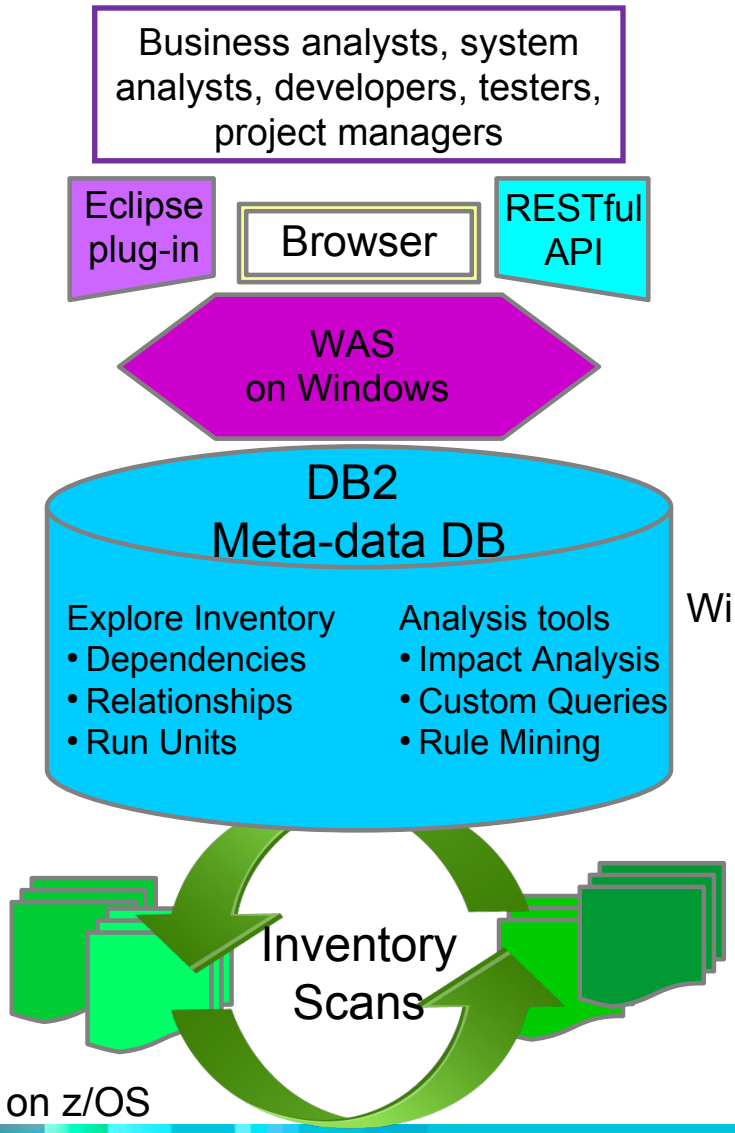
Scannable on z/OS

Java technology-based applications, HTML, JavaServer Pages (JSP), Enterprise JavaBeans (EJB), enterprise archive (EAR), Web archive (WAR) and Java archive (JAR) files, and C/C++

Scannable on Windows or AIX

Rational Asset Analyzer Architecture

Integrated Development Environment
- Integrating analysis with coding tools
  - Integrated views
  - Web View



- Companion tool integration
  - Dashboards
  - Portfolio Analysis
- Business tools extracts
  - Documents
  - Spreadsheets

On Windows

COBOL, PL/I applications for CICS, IMS and DB2 plus z/OS Job Control Language (JCL) and High Level Assembler

Scannable on Windows
CICS, IMS, DB2, &HLASM on z/OS

Java technology-based applications, HTML, JavaServer Pages (JSP), Enterprise JavaBeans (EJB), enterprise archive (EAR), Web archive (WAR) and Java archive (JAR) files, and C/C++

Scannable on Windows

RAA Version 6 & RAA for System z Siblings Products

- Independent offerings
- Common metadata schema
- Consistent results for common functions

RAA for System z

- ESW Product: 5655-W57
- Charge Metric: Value Units
- Installs on z/OS
- Scans artifacts “in place”
  - z/OS source & “resources of interest”
  - Data retained in DB2 for z/OS
- Provides a remote component for Windows or AIX server for scan of Java assets
- Same functionality as RAA on Windows
- Supports “shared knowledge” use case

RAA

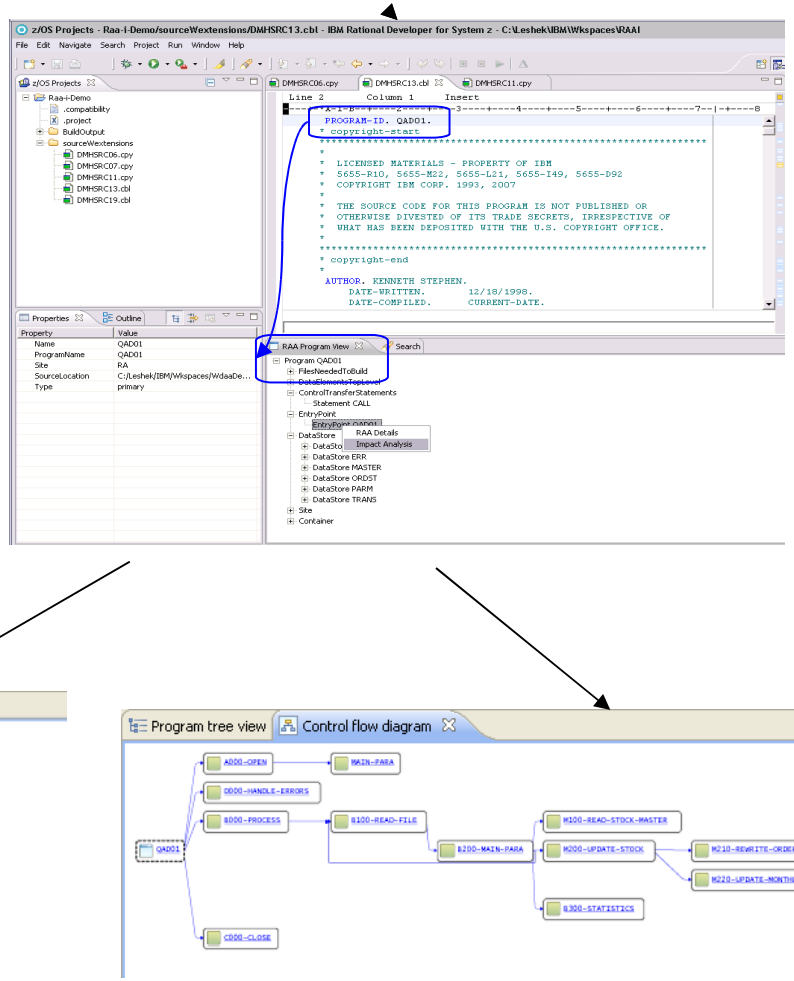
- PPA Product: 5724-V27
- Charge Metrics: Auth/Float User, Token
- Installs on Windows, including Windows 7
- Scans offloaded to Windows
  - COBOL,PL/I,JCL downloaded to RAA
  - Java EE on Windows only
  - Data retained on DB2 on Windows
- Provides a light z/OS component for
  - –CICS/IMS/DB2 “resources of interest”
  - •High Level Assembler
- Same functionality as RAA for System z
- Supports the “shared knowledge” and “individual (with RDz)” use cases

RAA & RDz – Eclipse based integration

Combine productivity gains of RDz with the enterprise-level insight in RAA

Benefits

- Provide software artifact analysis of local workspaces to the developer
- Reduce developer's time needed to understand impact and make the changes in complex applications
- Allow developers to see their work in context of heterogeneous artifacts across the whole enterprise
- Bring enterprise analysis directly into developer workspace



Integration with Rational Developer for System z

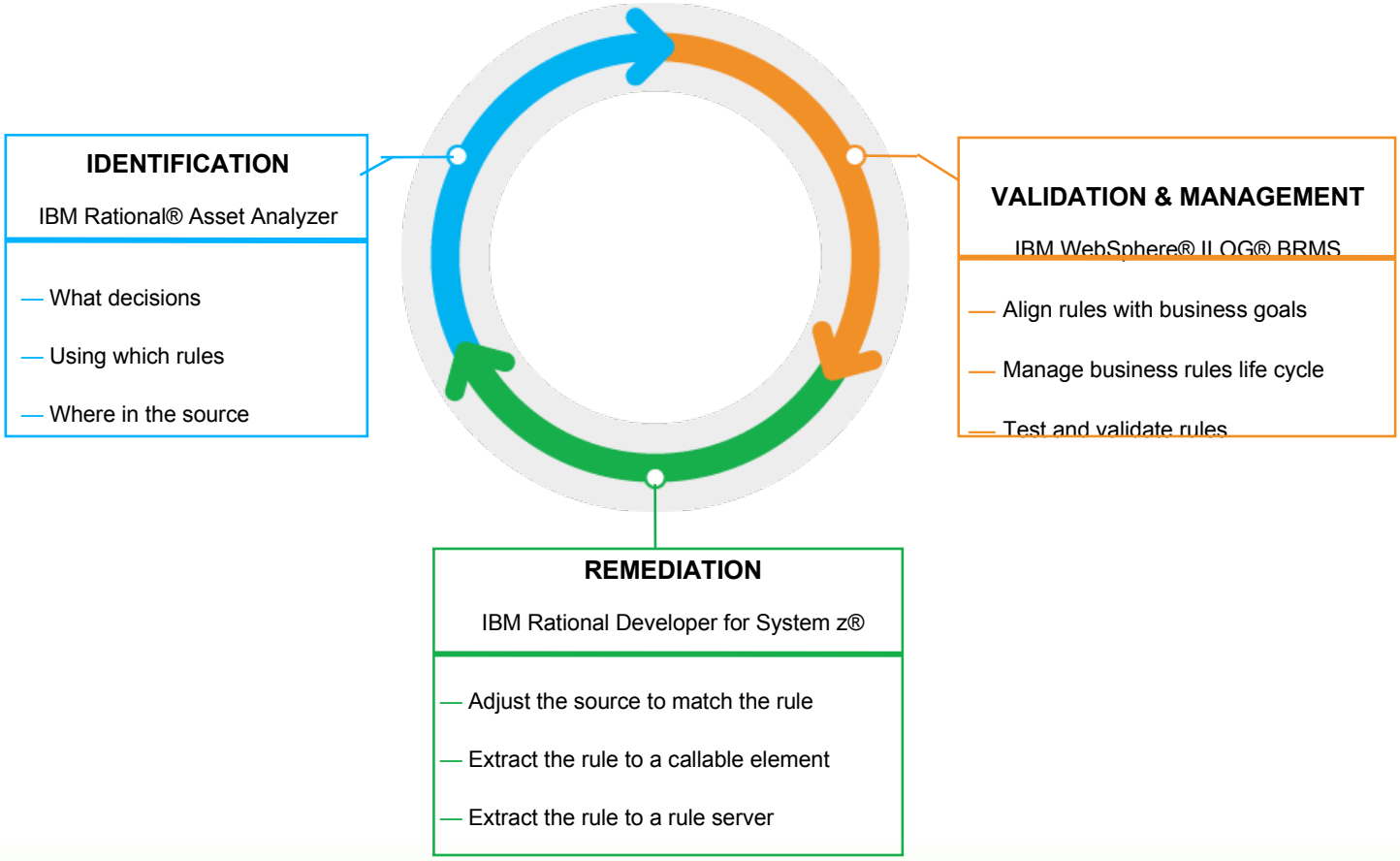
- Provided with Rational Asset Analyzer and Rational Asset Analyzer for System z
- Installed into same RDz Eclipse shell
- Useful RAA capabilities with an Eclipse-based user interface
- Seamless transition from the RDz user interface to browser-based RAA interface using embedded browser of Eclipse environment
- Multiple deployment options
  - Single Use Case: RDz + RAA integration + local RAA
  - Shared Use Case: RDz+RAA integration + remote connection to RAA(s)

Why Business Rule Modernization & Why now?

- Business need: Business application “decision making” needs to adapt to changes in the marketplace, in time to make a difference

- Application Development drivers:
  - Cost savings
    More effective application development & maintenance with less business risk
    Consolidation/Restructure of existing applications, saving hardware & resources
  - Changing ratio of source inventory to development skills
    Forcing need for formal processes with an on line electronic repository
  - Be able to react to changes requested by business in days, not months
- Business Rule Modernization: Applying technology and process to gain increased “decision making” agility for business applications

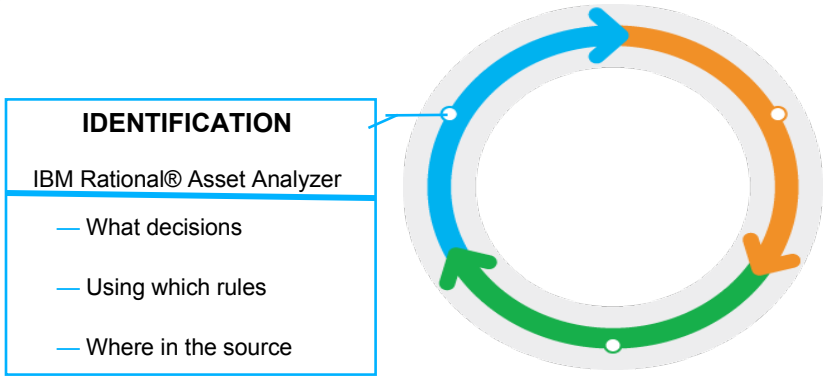
Business Rule Modernization



Delivering…

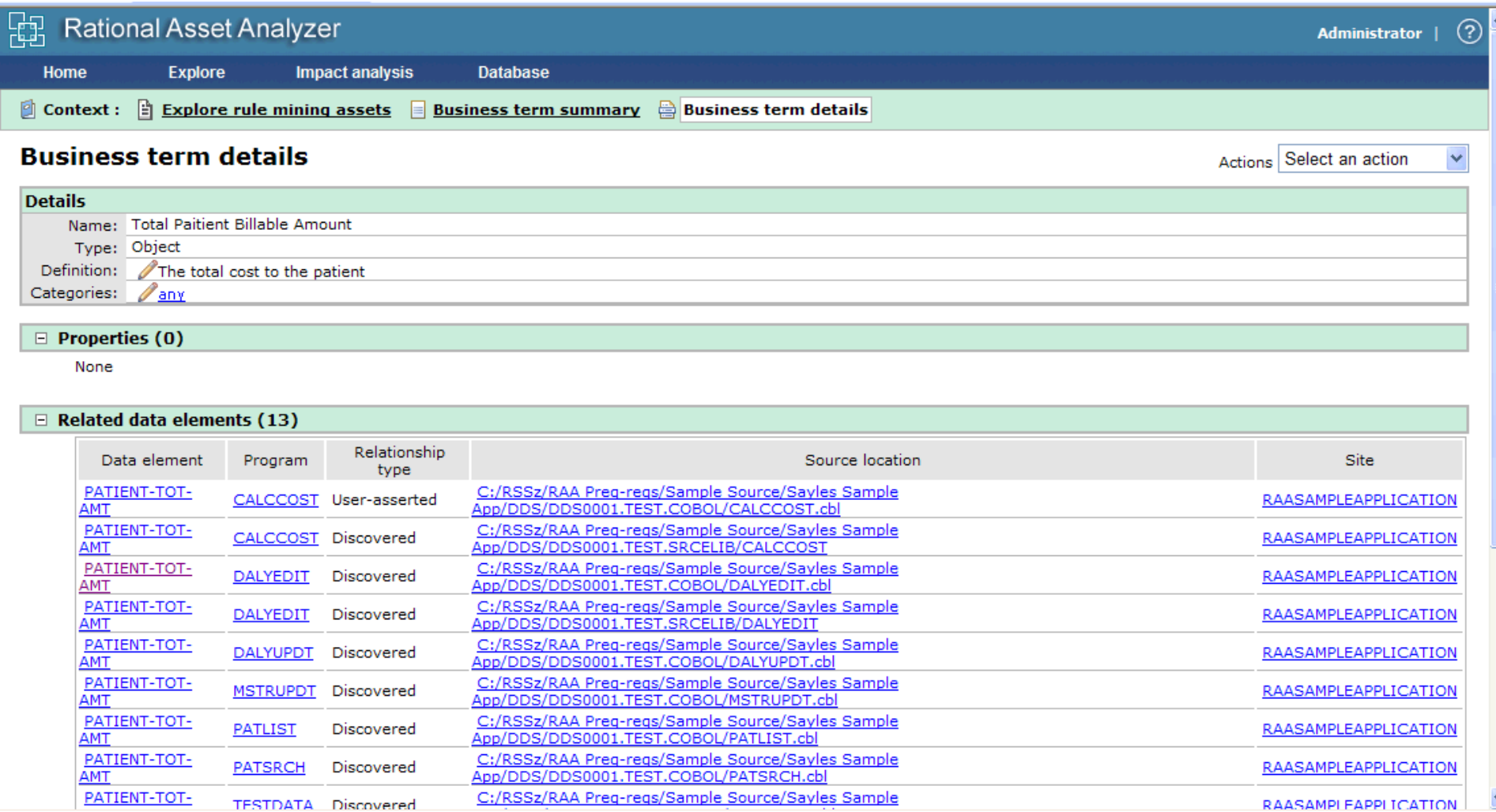
The essentials for business rule mining of existing software assets enhancing the ability to capture, maintain and take advantage of application knowledge that can provide insight into an application's structure and its interactions with business data.

Business Rule Mining with RAA V6



- Scope the effort
  - Defined Business Goal; with process model with specific set of business decisions
  - Deliver incremental value: Keep a manageable size with timely deliverables
- Establish the vocabulary
  - Import Business Terms from ILOG BRMS or define them with RAA dialogs
  - Map Business Terms to developer “terms”, code variables and data elements
- Define the candidate business rules
  - RAA will identify source statements that “act” on the business terms through their associated data elements
  - Form unstructured candidate rules based on the identified source statements
  - Create structured candidate business rules using ILOG Editor within RAA
- Export Rules to ILOG

Business Rule Modernization: Identification ...



Business Rule Modernization: Identification ...

```
31.  003100
32.  003200      IF HI
33.  003300         COMPUTE CUST-DISC-PCT = F1 + F2
34.  003400      ELSE
35.  003500         DISPLAY "NO DISCOUNT".
36.  003600
37.  003700      GOBACK.
38.  003800/
39.  003900 100-FACTOR2.
40.  004000
41.  004100      IF C-AGE > 55
42.  004200         COMP
43.  004300      ELSE
44.  004400         SET
```

Relate statement to a business rule
Relate data element to a business term or property
Show data element details

Relate to a Business Rule

Relate the IF Statement to a business rule.

Business rule:
Provide discount for seniors

The statement has the following data elements with related terms and term properties:

Data element	Term or term property
C-AGE	age

Relate Cancel

Add a Business Rule

Name of the business rule:
Provide discount for seniors

Documentation (optional):
If a person's age is over some threshold, give them a discount.

Add Cancel

Rational Asset Analyzer boyerpl

Home Explore Impact analysis Database

Context : Explore rule mining assets | Business rule summary | Business rule details

Business rule details

Actions Select an action

Details

Name: Provide discount for seniors
Documentation: If a person's age is over some threshold, give them a discount.

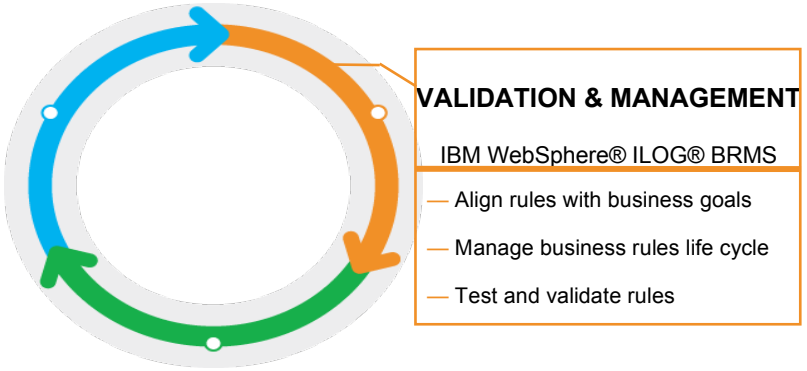
Related statements (1)

Statement	Program	Relationship type	Source location	Site
IF	DISCOWE	User-asserted	C:/brm/testdata/BusinessRuleMining/src/DISCOWE.CBL line 41	MYSITE

User-related assets (0)

IBM Aug 10, 2010 5:37:20 PM

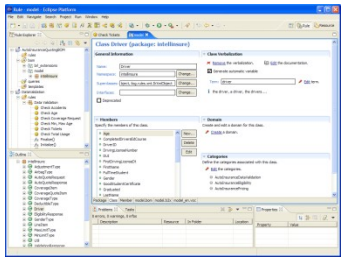
Business Rule Mining with RAA V6

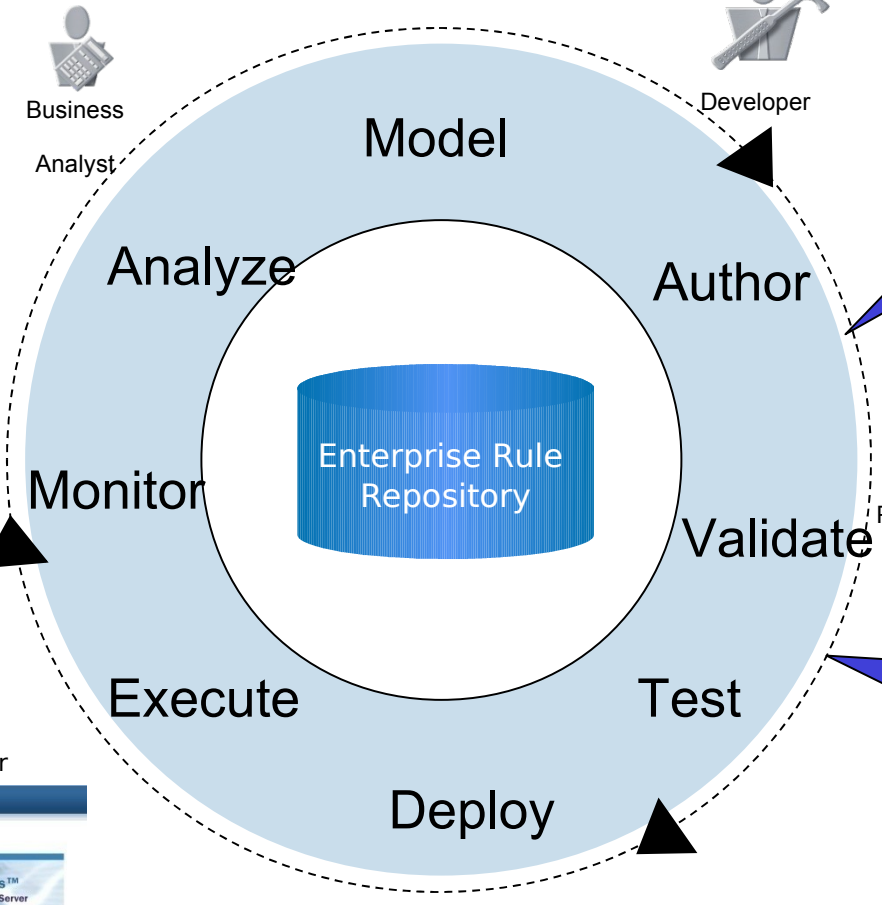


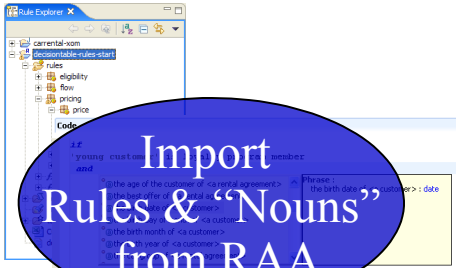
- Validate the Rules
  - Review candidate rules with business analysts
  - Establish what the rule “should be” vs “what it is” in the source
  - Build rule project in Rule Studio
  - Within ILOG BRMS, capture any rule project revisions
- Analyze and test rules
  - Using rule analysis in Rule Studio reconcile any conflicting rules
  - Consider value/impact of sharing rules
  - Test and Simulate rule project in ILOG BRMS to validate business outcome
- Select Source Code Remediation Options
  - Update application source to conform to ILOG BRMS implemented rules
  - Update application source to call ILOG Rules for COBOL generated program
  - Update application source to call ILOG Rule Execution server, directly or via web service

Business Rules Management System (BRMS)

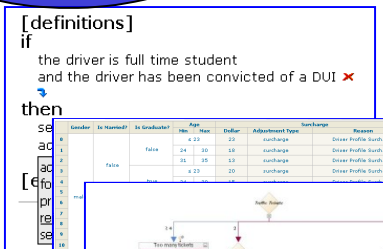
Provides complete functionality and tooling to fully maintain and manage an organization's business rules through the complete business rule life cycle by multiple roles.

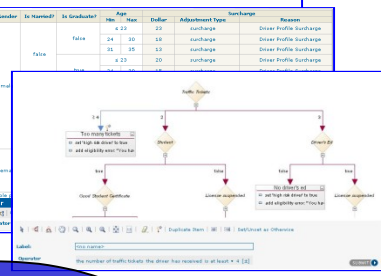




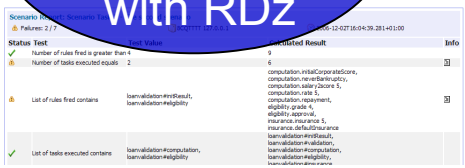


Import Rules & "Nouns" from RAA





Remediate source with RDz



Restful Interface

RESTful Interface completely revamped

- Full support for relevant asset types, attributes and relationships
- Displacing Web Services interface technologies
- Added special content type for integration with Insight

  "How to use Rational Asset Analyzer with Rational Insight for metrics"
  by Leigh Weston and Paul Boney on developerWorks
- Added support for custom queries for easy report generation by many tools

Rational Asset Analyzer (RAA) - REST Interface

up - about

url	description
admin	Administrator functions
assets	Explore and search RAA assets
cq	Execute RAA custom queries
metrics	Explore RAA metrics
ping	Test RAA REST interface connection
signal	Callback signal interface

Available asset types

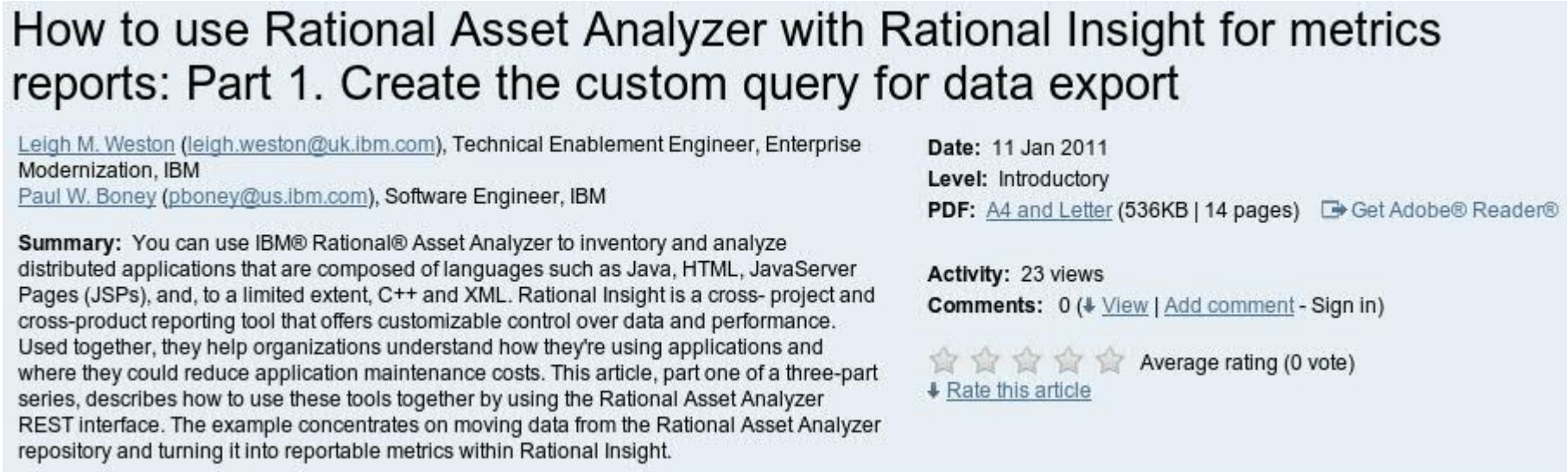
up - about

link	label	id	mainTable
Application	Application	26	DMH.DMH_APPLICATION
Archive	JAR file	100	DMH.DMH_ARCHIVE
ArchiveManifest	Archive manifest file	101	DMH.DMH_ARCH_MANIFEST
BatchJob	Batch job	7	DMH.DMH_BATCH_JOB
BmsMapDef	BMS map definition	13	DMH.DMH_MAP
BmsMapSetDef	BMS map set definition	20	DMH.DMH_MAPSET
BpModel	Business process model	430	DMH.DMH_BP_MODEL
BpProcess	Business activity	431	DMH.DMH_BP_PROCESS
BrRule	Business rule,Business rules	480	DMH.DMH_BR_RULE
BrmCategory	Category	400	DMH.DMH_BRM_CATEGORY
BtTerm	Business term	401	DMH.DMH_BT_TERM
BtTermProperty	Business term property	402	DMH.DMH_BT_TERM
BytecodeClass	Java bytecode class	102	DMH.DMH_BYTECODE_CLASS
BytecodeField	Java bytecode field	103	DMH.DMH_JBC_FIELD
BytecodeMethod	Java bytecode method	104	DMH.DMH_JBC_METHOD
CicsGroup	CICS group	33	DMH.DMH_CICS_GROUP
CicsOnlineRegion	CICS online region	11	DMH.DMH_ONLINE_REGION
CicsTransaction	CICS transaction	6	DMH.DMH_TRANSACTION
Container	Container	23	DMH.DMH_CONTAINER
Cpp	C++	105	DMH.DMH_CPP
DataElement	Data element	2	DMH.DMH_DATA_ELMT_ALIAS

Integrating Asset Analyzer knowledge into Insight

- Step by Step “cookbook” with step by step visual examples
  - Pull the data via RAA's Custom Query
  - Load the information into Rational Insight
  - Layout the information on Insight's displays
- Located on developerWorks

  http://www.ibm.com/developerworks/rational/library/using-asset-analyzer-with-insight-for-metrics-reports-part1/



How to use Rational Asset Analyzer with Rational Insight for metrics reports: Part 1. Create the custom query for data export

Leigh M. Weston (leigh.weston@uk.ibm.com), Technical Enablement Engineer, Enterprise Modernization, IBM
Paul W. Boney (pboney@us.ibm.com), Software Engineer, IBM

Summary: You can use IBM® Rational® Asset Analyzer to inventory and analyze distributed applications that are composed of languages such as Java, HTML, JavaServer Pages (JSPs), and, to a limited extent, C++ and XML. Rational Insight is a cross- project and cross-product reporting tool that offers customizable control over data and performance. Used together, they help organizations understand how they're using applications and where they could reduce application maintenance costs. This article, part one of a three-part series, describes how to use these tools together by using the Rational Asset Analyzer REST interface. The example concentrates on moving data from the Rational Asset Analyzer repository and turning it into reportable metrics within Rational Insight.

Date: 11 Jan 2011
Level: Introductory
PDF: A4 and Letter (536KB | 14 pages) Get Adobe® Reader®

Activity: 23 views
Comments: 0 (View | Add comment - Sign in)

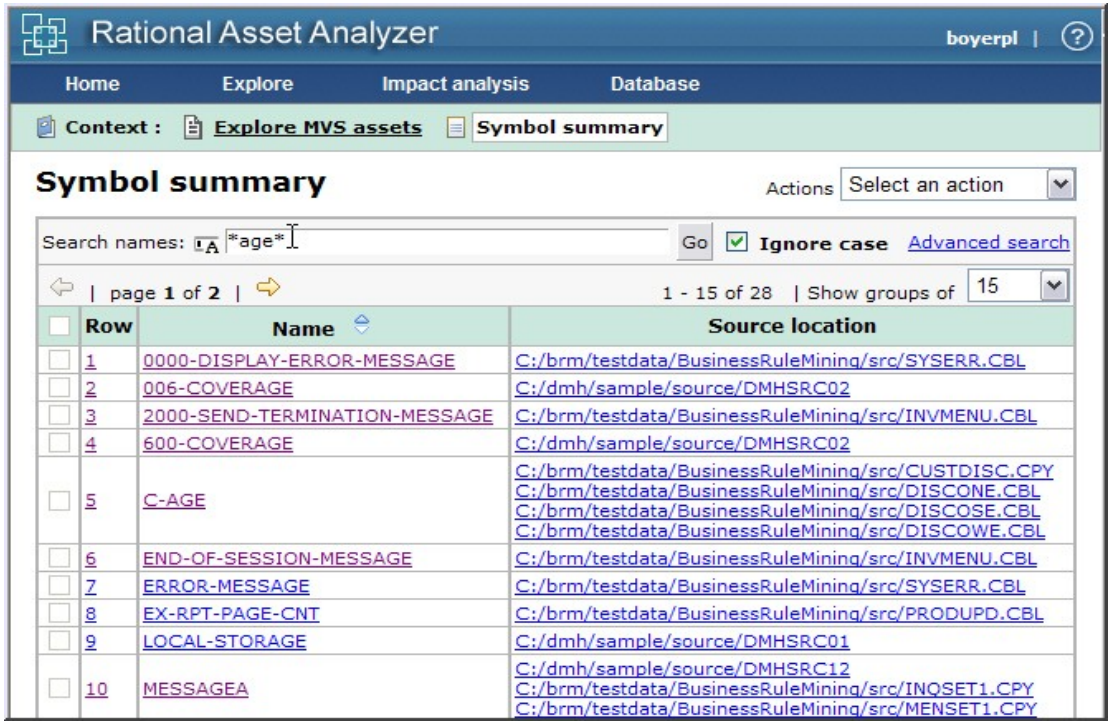
Average rating (0 vote)
Rate this article

Unstructured Symbol Scans

Enhancing RAA analysis capabilities through unstructured symbol scan support

- Ability to identify and capture almost any symbol in a broad set of files as additional meta data
- Expanded meta data can be included in Inventory, custom query and relationship analysis

Symbol
A sequence of characters with the following properties:
- First and last characters can be any of the following: A-Z a-z 0-9 _
- Internal characters can be any of the following: A-Z a-z 0-9 _ * .
- At least 3 characters in length
- Not a common dictionary word



For more information on Rational Asset Analyzer

- ibm.com product web pages:
  - http://www.ibm.com/software/rational/products/raa/
- developerWorks pages:
  - http://www.ibm.com/developerworks/rational/products/raa/
  - http://www.ibm.com/developerworks/rational/library/using-asset-analyzer-with-insight-for-metrics-reports-part1/
- Data Sheet: http://www.ibm.com/common/ssi/cgi-bin/ssialias?infotype=PM&subtype=SP&appname=SWGE_RA_RA_USEN&htmlfid=RAD14021USEN&attachment=RAD14021USEN.PDF
- Enterprise Modernization Sandbox: http://www.ibm.com/developerworks/downloads/emsandbox_systemz/index.html
- Business Rule Modernization Brochure: http://www.ibm.com/common/ssi/cgi-bin/ssialias?infotype=PM&subtype=BR&appname=SWGE_RA_ZV_USEN&htmlfid=RAB14042USEN&attachment=RAB14042USEN.PDF
- Trial download: http://www.ibm.com/developerworks/downloads/r/assetanalyzer/?S_CMP=rnav

Questions