



IBM Software Group

Accelerate modernization of enterprise assets using IBM's discovery and transformation tools

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Rational software



Agenda

- The challenge – Business and IT drivers
 - ▶ Complexity
 - ▶ Typical Application Development Lifecycle
- Case study snapshots
- WebSphere Studio Asset Analyzer (WSAA)
- Rational Transformation Workbench (RTW)
- Summary: Common Scenarios
- Question & Answers



Business Drivers

Business and IT imperatives drive changes in the application portfolio

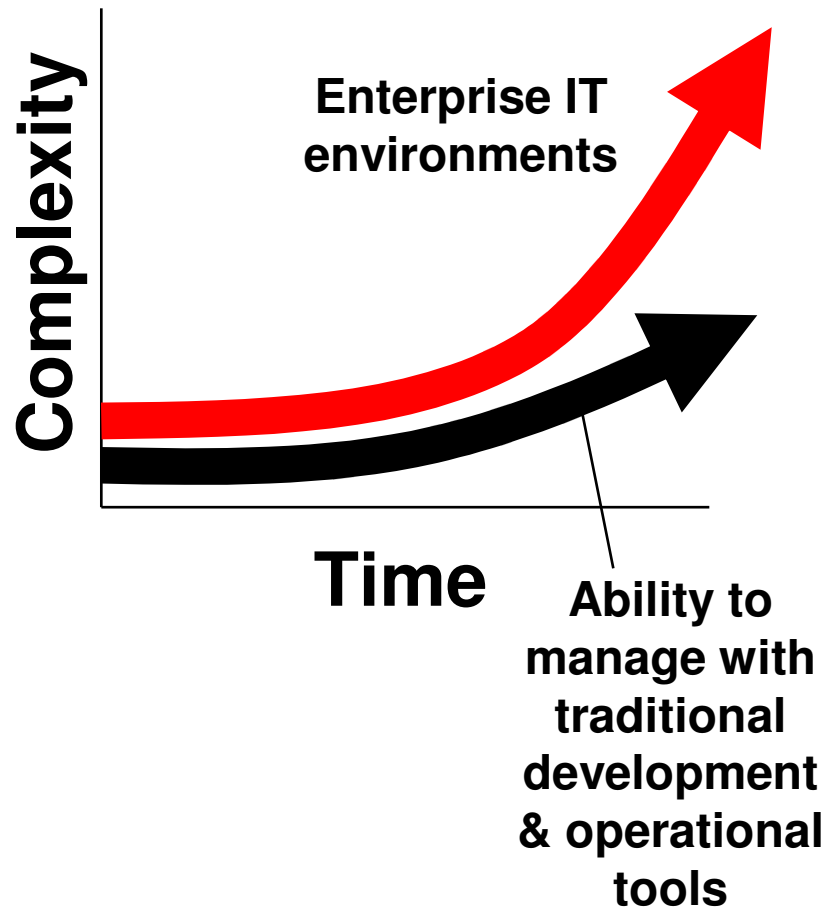
- Application Consolidation and Mergers: **connect and combine disparate applications and operations**
- Compliance: **align and audit operations to comply with industry and government regulations**
- Cost and Complexity Reduction: **enhance the efficiency and maintainability of your enterprise applications**
- Enterprise Speed and Flexibility: **accelerate go-to-market strategies through a more flexible application portfolio**
- Operational Risk Reduction and Control: **maintain control of business-critical enterprise operations**
- Outsourcing Management: **reduce the costs and risks of outsourced your enterprise applications – for both parties**
- Resource Allocation: **manage resources and knowledge transfer to maximize returns for your organization**
- Preparing for Web Services & SOA: **get more business value from your existing enterprise applications through reuse**



**Understand & Manage
Transform & Maintain**



The Challenge of Complexity



Complexity makes...

- **Change** more difficult & costly
- **Operations** more difficult & costly
- **Outages** more likely

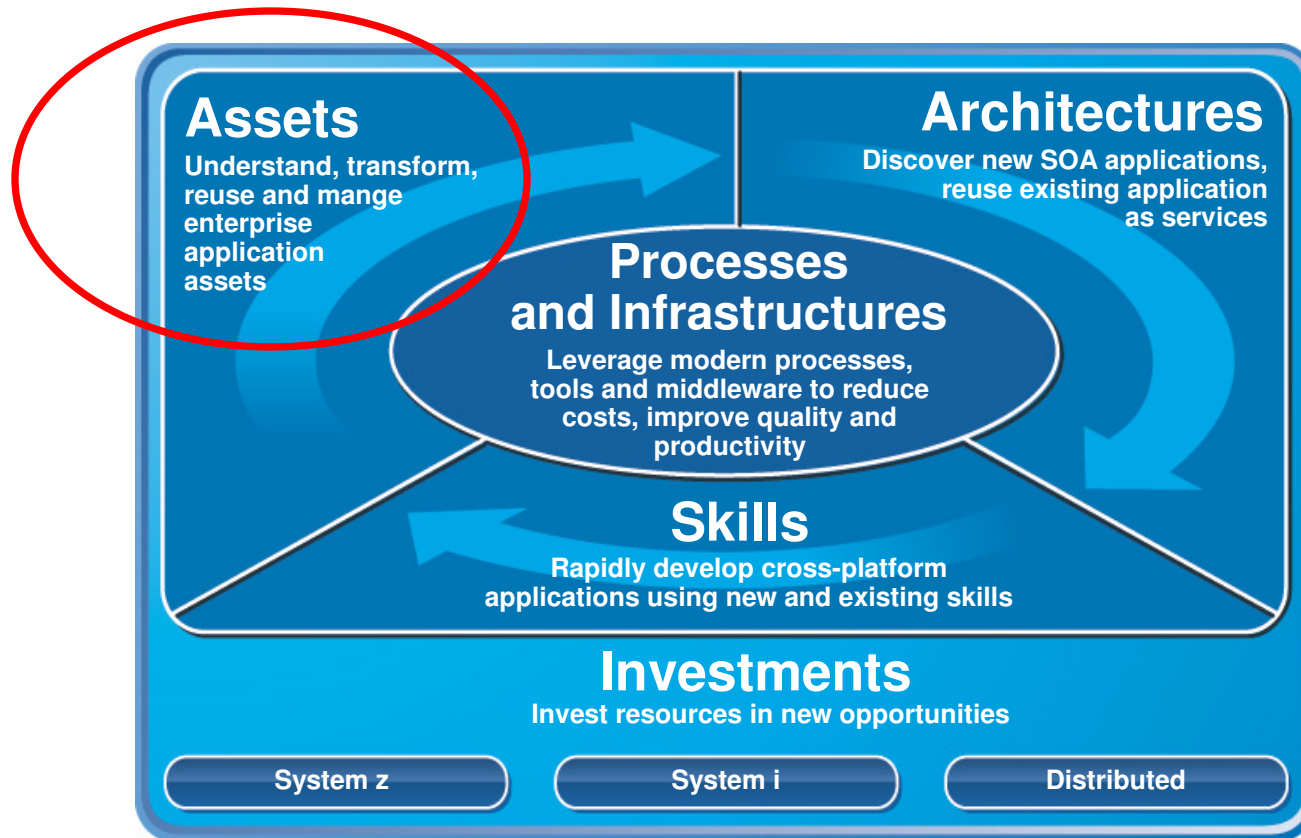
Solving this requires ...

- Good AD processes
- Good IT Service Management Processes
- Good understanding of your IT applications and environment
 - ▶ Development and operations



Aspects of Enterprise Modernization

To improve IT flexibility, you should **modernize** your enterprise in the following areas:



Asset Modernization

“OK. I have hundreds of services, thousands of programs using many different technologies. How do I understand and identify the assets that I can use them in my SOA?”



Architects, project leaders, managers, DBAs, developers, Q/A analyst

Enterprise-wide app discovery and insight; find dependencies across applications and lines of business

**Application Portfolio Understanding
WebSphere Studio Asset Analyzer (WSAA)**



Architects, project leaders

Project-level workbench for deep application analysis and transformation

Rational Transformation Workbench (RTW)



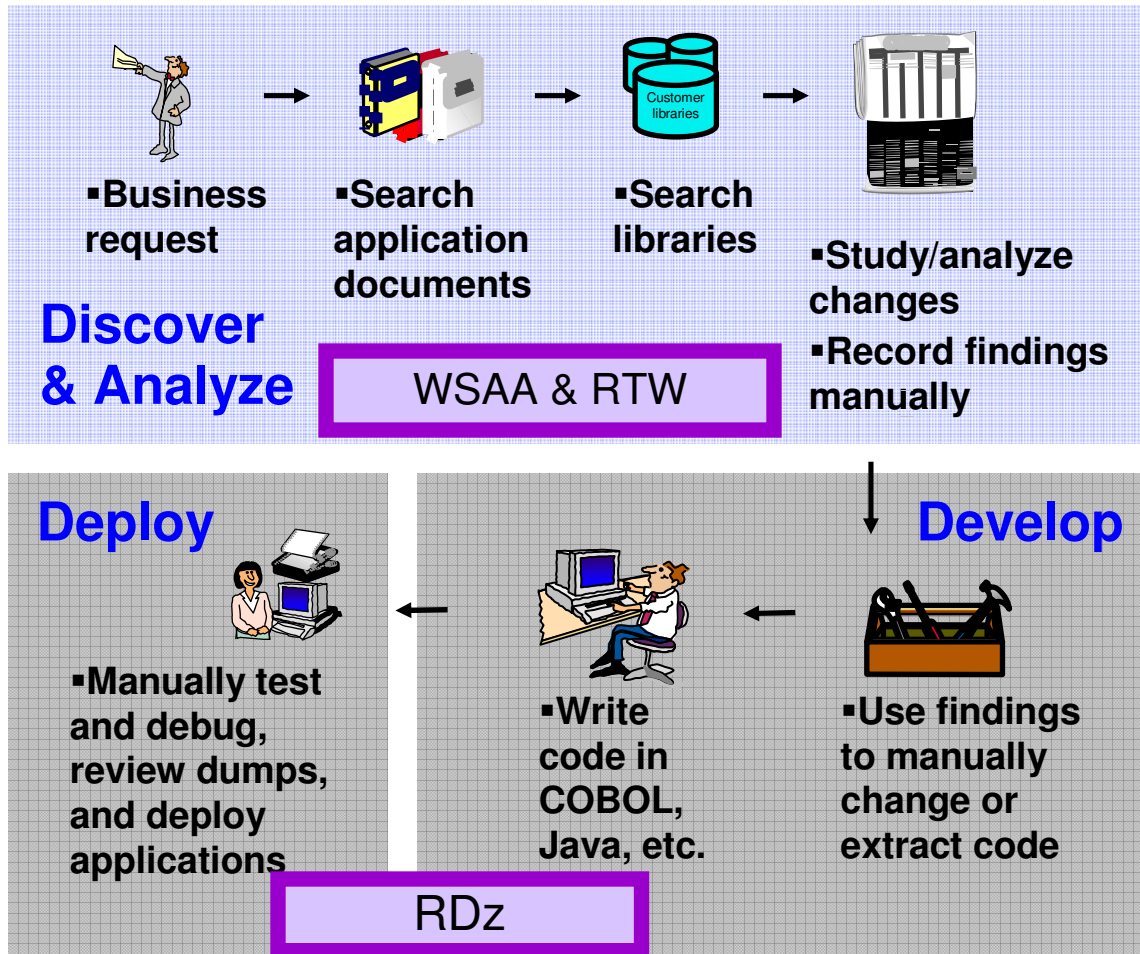
Developers

Common IDE for COBOL, PL/I, Java and Web services applications (Program analysis)

**Rational Developer for System z
RTW Analyzer for Eclipse/WDA**



Typical AD Process



■ Problems

- ▶ Missing or out of date documentation
- ▶ Important artifacts are missing
- ▶ Hard to determine full impact of proposed changes
- ▶ Hard to estimate effort required

■ Tools used:

- ▶ ISPF
- ▶ old notes
- ▶ old listings

▶ Time consuming and tedious



Customer Pain – Project Estimates

▪ Growing retail chain

▶ Background

- Yearly planning cycle requires lots of estimates from Applications team

▶ Challenge:

- Analysts were performing initial scans of source by hand taking at least a week
- Developers receiving information took much longer to produce detailed estimates
- Process was error prone and obsolete programs could not be easily identified

▶ Solution

- Inventoried application source in WSAA
- Educated Analyst community on new impact analysis processes using WSAA
- Significantly improved accuracy and turn-around time for estimates in yearly cycle
- Developers are using WSAA to do their own estimates on demand when asked to make “small” changes

“I am finding things with WSAA that I never would have found using the old, manual analysis process”

-Systems Analyst

“Inventory scan errors are identifying problems in our source, which is a good thing.”

-Systems Administrator



Customer Pain – Managing change across applications

■ Global manufacturer

▶ Background:

- 300+ internal projects are changing code and data formats
- Large inventory
 - 140K batch jobs and 200K programs, 126K DB2 columns, 81M data elements, 177M LOC

▶ Challenge:

- Need to avoid system outages due to data format changes as well as analysis paralysis
- Need cross-team communications and coordination

▶ **Solution:** Include WSAA discovery as step in data format change control process

- Data management group runs batch jobs against WSAA repository and distributes reports to application teams
- Affected application teams must sign-off on changes
- Then synchronize deployments to QA and production

■ According to Gartner - up to 80% of systems failures are caused by unmanaged changes

■ Even when managed, 20% of planned changes cause system outages due to lack of visibility to dependencies

“We can’t imagine how we would run our business without WSAA”
– Manager in the Data Management Group



Customer Pain – Adapt systems for new business opportunity

■ Global manufacturer:

▶ Background

- Current product accessories system consists of IMS transactions, databases, and batch jobs

▶ Challenge:

- Need to expand existing systems so company can offer more, higher-margin accessories

▶ Solution ...

- Do Impact Analysis using WSAA & RTW
 - Used results as input to transformation vendor
 - Used results to address changes the vendor could not address
- Use WSAA's understanding of system to ...
 - Find potentially obsolete JCL and programs through correlation with run logs
 - Rapidly build test environment with Test Environment Builder (IBM Global Services asset)

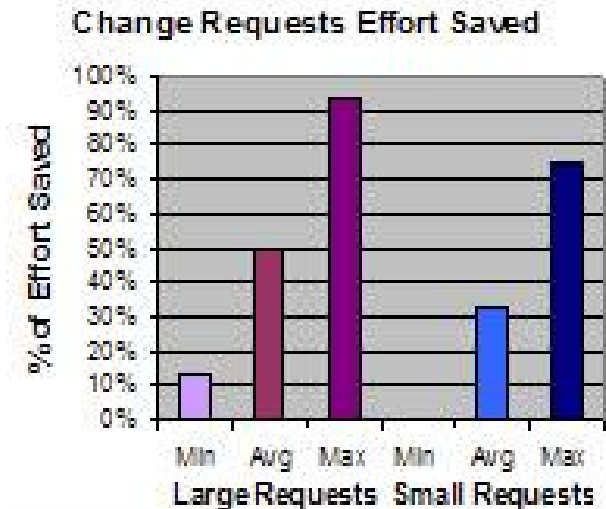
“We are very pleased with WSAA. It's doing just what we want and need it to do.”
– AD Manager



More Efficient Maintenance and Enhancement

Client-led ROI studies revealed significant savings for M&E activities

- Understand and manage applications
 - ▶ Inventory and baseline metrics of applications allow managers to focus effort on the most pressing issues
 - ▶ Management insight gained with 99% reduction in effort
- Transfer knowledge and encourage resource pooling
 - ▶ Through the automated documentation of applications, users are able to get up-to-speed more quickly, allowing even junior developers to become productive
 - ▶ Documentation received 70% faster
- Maintain quality applications
 - ▶ Enables developers to ask 'what-if' type questions allows teams to avoid cascades of errors
 - ▶ Impact analysis conducted over 87% more rapidly
- Increase the effectiveness of change requests
 - ▶ At the core of M&E activities is the ability to modify an application to reflect new business needs
 - ▶ Large change requests required up to 94% less effort



Efficient Business Rule Discovery and Management

- Leading insurer eliminates inefficiency in claims system
 - ▶ Claims processing delays were lowering customer service and increasing costs per claim
 - ▶ Claims processing application was highly complex and not well understood
 - ▶ Each time application detected an error, claim required manual intervention
 - ▶ Business rule identification and impact analysis used to uncover relevant business processes
 - ▶ Developers could quickly correct the inefficiency, reducing claims costs
 - ▶ Collapsed root cause determination for pending claims by 70%
- Multi-national insurance provider controls logic of core application
 - ▶ To boost customer service, needed more flexibility for key application
 - ▶ Analyzed application and identified business processes buried within the code that could be better integrated and maintained



Application Renovation Yields Efficiencies

- Major health insurer
 - ▶ Streamlined core claims processing system and implemented a message based interface (in conjunction with existing batch processes)
 - ▶ Reduced cost per claim by 1/3
- Top 5 US bank simplified complex, non-standard application
 - ▶ Critical application was developed and maintained with limited understanding of the application's current state
 - ▶ Application renovation reduced code base from 20 million lines to just 12 million, greatly reducing complexity
 - ▶ Repository of documentation and visualizations allowed maintenance team to get 'up-to-speed' and productive
- Financial services organization addressed potential impacts before renovations undertaken
 - ▶ Very large financial services provider wanted to sunset a core financial application, but needed to ensure that all impacts were planned for
 - ▶ Complexity of application meant that the project might be delayed for months
 - ▶ Pinpointed all potential impacts in a matter of days, not months, allowing the renovation initiative to proceed aggressively



Value of Asset Modernization tooling

- Gain intellectual control of your applications
 - ▶ discovery
 - ▶ relationships / dependencies
 - ▶ application and program structure
- Increase project velocity
- Improve quality of application changes
- Enable developers & teams to work “above their experience level”
- Document your applications from the code itself
 - ▶ consistently current application insight
- Improve change management / governance / compliance processes
- Gain transparency into outsourced development
- Find assets required for test cases
- Incorporate into existing IT operational processes



Modernizing Assets

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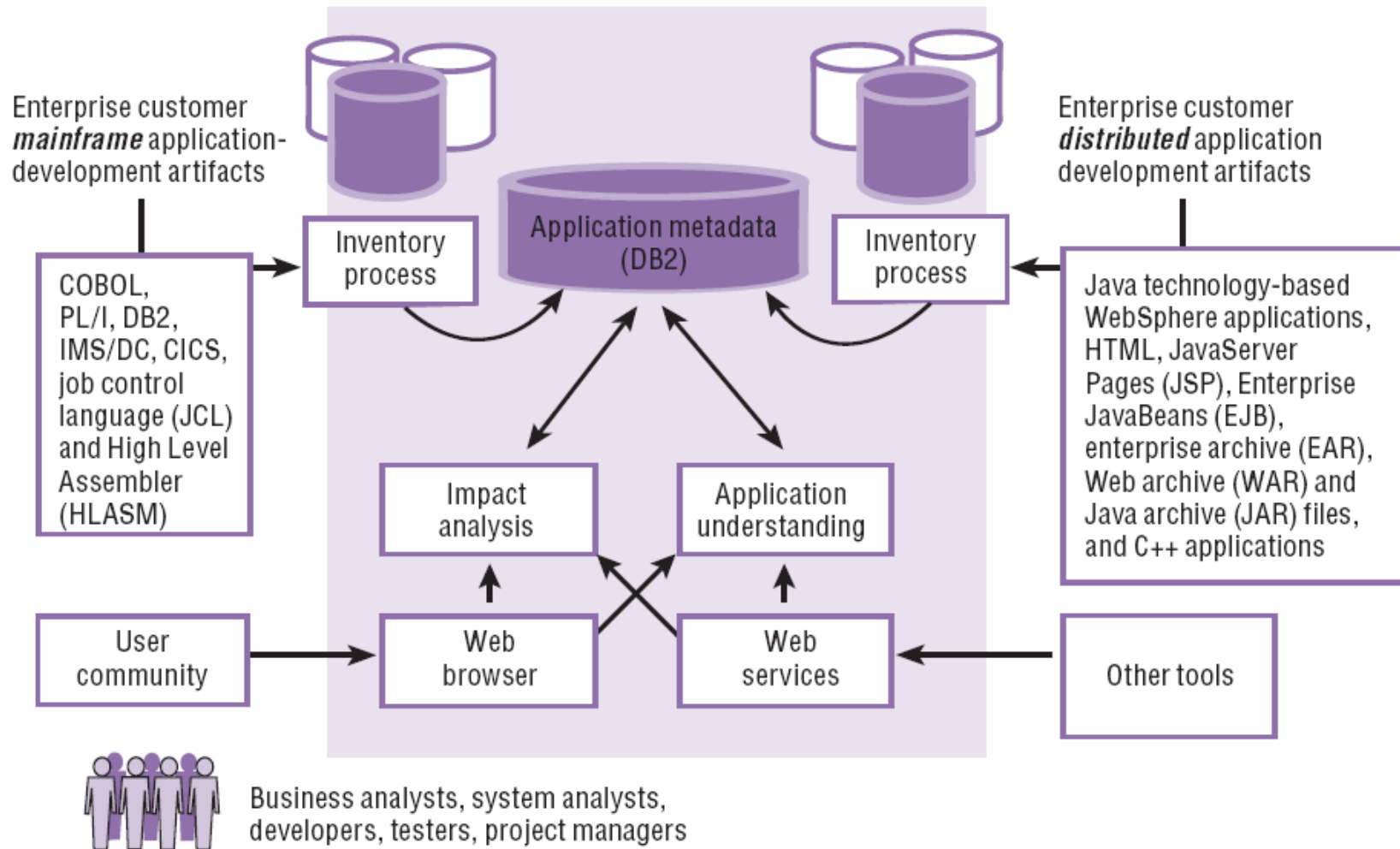
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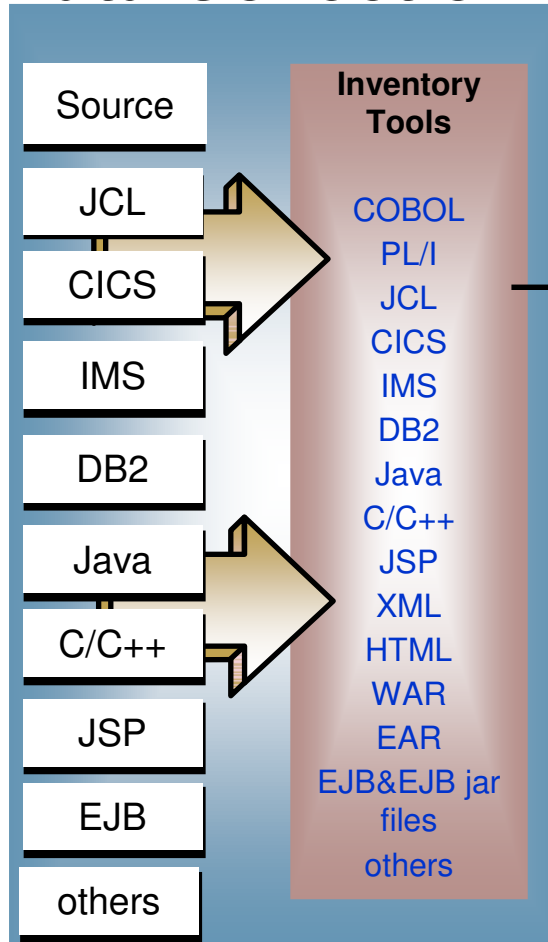


WebSphere Studio Asset Analyzer V5.1

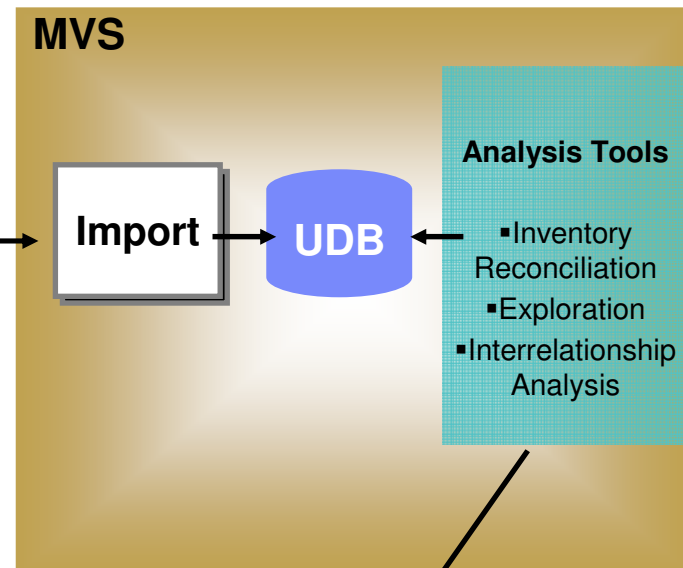


Gathering Application Metadata

Data Collection



Data Analysis



Web browser



Exploring mainframe assets – rapid application understanding

Enter one or more search strings. A wildcard * character can be used.

Explore MVS assets: Type mixed case [Advanced search](#)

Actions: Select an Action

Run time	Total	Program	Total	Data	Total
Batch job	29	BMS map definition	9	Data element (?)	8881
CICS group	214	BMS map set definition	1640	Data set	207
CICS online region	5	Concatenation set	3	Data store	115
CICS transaction	896	DB2 stored procedure	0	DB2 column	9
DB2 system	2	Entry point	48	DB2 table	2
IMS DBD	11	IMS PSB	43	DD name	899
IMS subsystem	3	Literal	2199	I/O record description	184
IMS transaction	23	Program	39		
Run unit (?)	382				

Or just click on any counter to see the full list of items



WSAA - impact analysis

WebSphere Studio Asset Analyzer for Multiplatforms
Version 5.1

Home Explore **Impact analysis** Database

Context : Home Impact analysis summary Impact analysis details: Im

Impact analysis details: Impact analysis results

Details

Impact analysis: QAD01:MASTER-STK-PART-NO - MC 8 17 2007
 Description: GENERATED for Program QAD01, Data element MASTER-STK
 Starting points for the impact analysis: Program/Element:
 QAD01/MASTER-STK-PART-NO
 Scope of analysis: <unlimited>
 Levels of impact analyzed: <unlimited>
 Created/last updated: 2007/08/16 11:14:00 AM by WSA1 / 2007/08/16 11:14:06 A

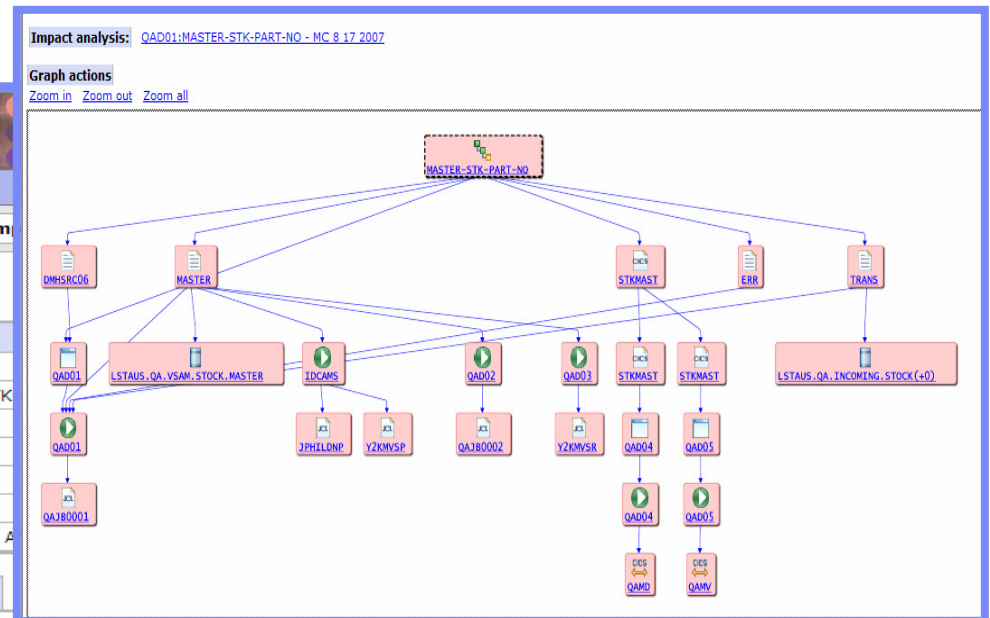
Overview Summary Details Metrics - overview Metrics - detailed User-related assets

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

Direct Impacts:
 0 CICS transactions
 0 IMS transactions
 1 Batch jobs
 Starting with 1 data elements in 1 programs
 9 Data elements
 0 Entry points
 0 Other impacted programs

Indirect Impacts:
 2 CICS transactions
 0 IMS transactions
 4 Batch jobs
 2 Data elements
 2 Programs

Data Stores:
 2 Data sets
 5 Data stores
 0 IMS segments
 0 DB2 tables



- Find the needles in the haystack affected by a proposed change



WSAA program insight

Program details

File: DMHSC13
 Program: QAD01
 Language/Type: COB / Program source
 Scanning options - actual: Proprietary scanner. Support any COBOL level. This is the most restrictive setting.
 Analysis status: Completed
 Metrics: Blank lines: 29, Comment lines: 47, Noncomment lines: 324, Number of lines in file: 400, Number of lines in program: 522, Splitting nodes: 47
 Site: WSAA
 Container: NTPS C:\DMH\SAMPLE\SOURCE\DMHSC13
 Data base updated: 2007/07/10 07:29:00 PM by WSAA2
 Concatenation set assigned: COB - DMH

Program Details

Source files used by this program

File (3)	Language	Type	Analysis status	Action	Number of lines in file	Source location
DMHSC06	COB	Included source	Completed	annotate	37	C:\DMH\SAMPLE\SOURCE\DMHSC06
DMHSC07	COB	Included source	Completed	annotate	19	C:\DMH\SAMPLE\SOURCE\DMHSC07
DMHSC11	COB	Included source	Completed	annotate	29	C:\DMH\SAMPLE\SOURCE\DMHSC11

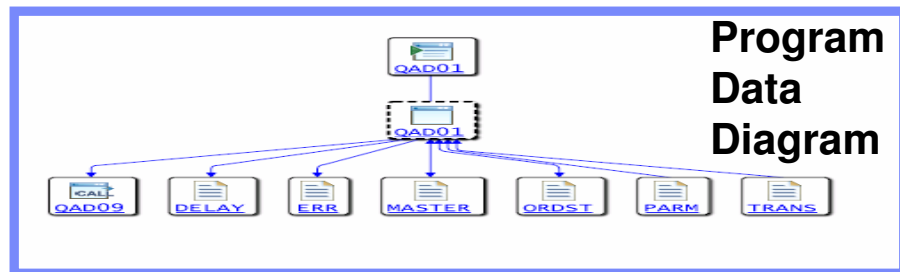
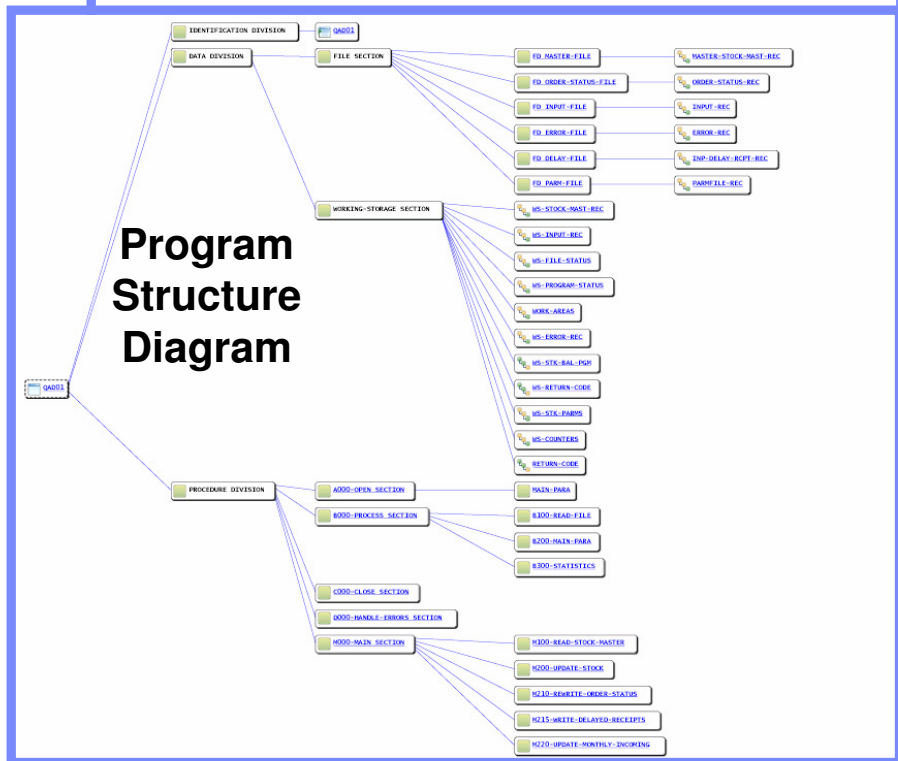
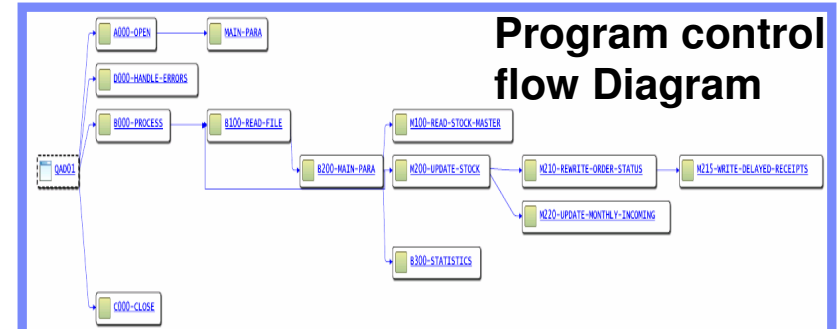
Control transfers

Entry points to which this program transfers control

Control transfer to (1)	Type	Sequence	Parameters
Static (Literal): QAD09	CALL	1	WS-STY-PADMS

Data stores

Data store (6)	Type	Program	Source location
DELAY	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSC13
ERS	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSC13
MASTER	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSC13
ORDST	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSC13
PARM	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSC13
TRANS	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSC13



Complexity metrics for mainframe assets

- **Halstead effort**, which indicates the complexity of a program and the relative mental effort required to develop or maintain the program
- **McCabe's Cyclomatic Complexity**, which indicates the number of independent paths through a program
- **McCabe's Essential Complexity**, which indicates how well a program is structured

WebSphere Studio Asset Analyzer for Multiplatforms Version 5.1

Home Explore Impact analysis Database

Context: Explore MVS assets Program summary

Program summary Actions Select an Action

Overview **Statistics** e-business information

Search Program names: |Q* Go Type mixed case [Advanced search](#)

Program (11)	Lines in program	Comment lines	External control flow transfers	Data Stores	Include files	Variables defined	Number of lines in file	Halstead effort	Essential complexity	Cyclomatic complexity
QAD01	522	47	1	6	3	93	400	56639	2	48
QAD02	491	36	3	5	2	80	398	66057	2	27
QAD02	491	36	3	5	2	80	398	66057	2	27
QAD02A	498	36	3	5	2	80	405	67873	2	27
QAD03	741	31	24	5	2	189	199	34211		
QAD04	481	47	0	3	5	160	236	15461	8	31
QAD05	608	53	0	2	7	194	290	24731	8	31
QAD06	164	36	0	0	0	15	164	24365	2	17
QAD07	337	70	0	0	0	78	337	42335	2	31
QAD08	179	22	0	1	1	33	138	9342	4	16
QAD09	269	26	0	0	3	45	156	10168	2	5

Exploring Distributed Assets and Web Services

WebSphere Studio Asset Analyzer for Multiplatforms
Version 5.1

Home Explore Impact analysis Database

Explore distributed assets

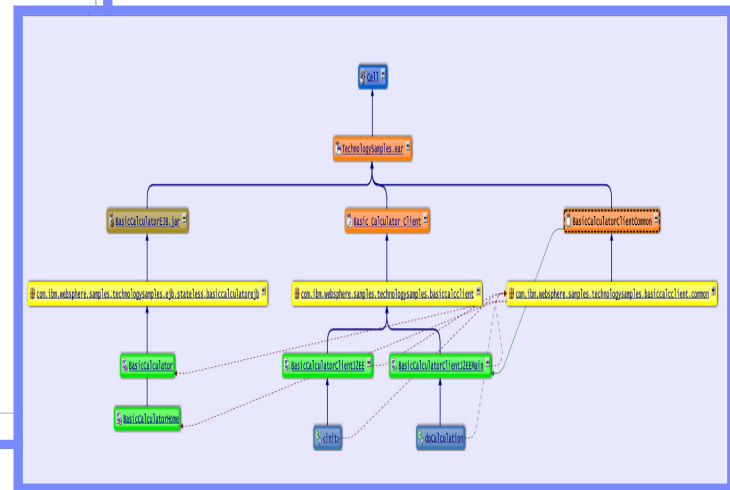
Search names: Go Ignore case [Advanced search](#)

Containers	Total	Java	Total	Web	Total	Other	Total	WebSphere app server	Total
Archive file	2	Java package	92	EJB	18	Archive manifest file	63	Application server	1
EAR file	2	Java bytecode class	1278	HTML file	343	C++	0	Generic server	1
WAR file	28	Java bytecode method	9935	JSP file	39	Text file	17	J2C connection factory	
EJB-JAR	9	Java bytecode field	4499	XML file	62	User input asset	0	J2C resource adapter	
J2EE client file	1	Java source class	551	Servlet	19	Unresolved asset	0	JMS connection factory	
Connector archive	0			JSP tag	228	Generic asset	65	JMS destination	
				JSP tag library	13			Cell	
				Tag library validator	0			Clone	
				Servlet event listener	0			Datasource	
				Filter	1			JDDBC driver	
								JMS provider	
								Mail session	
								Node	
								Server group	

Explore web service assets

Search names: Go Ignore case [Advanced search](#)

Web service assets	Total	Web service endpoints	Total
WSDL file	3	Java provider endpoint	0
Java web service	3	Java requester endpoint	3
CICS web service	2	CICS pipeline	5



Java web service summary

Search names: Go Ignore case [Advanced search](#)

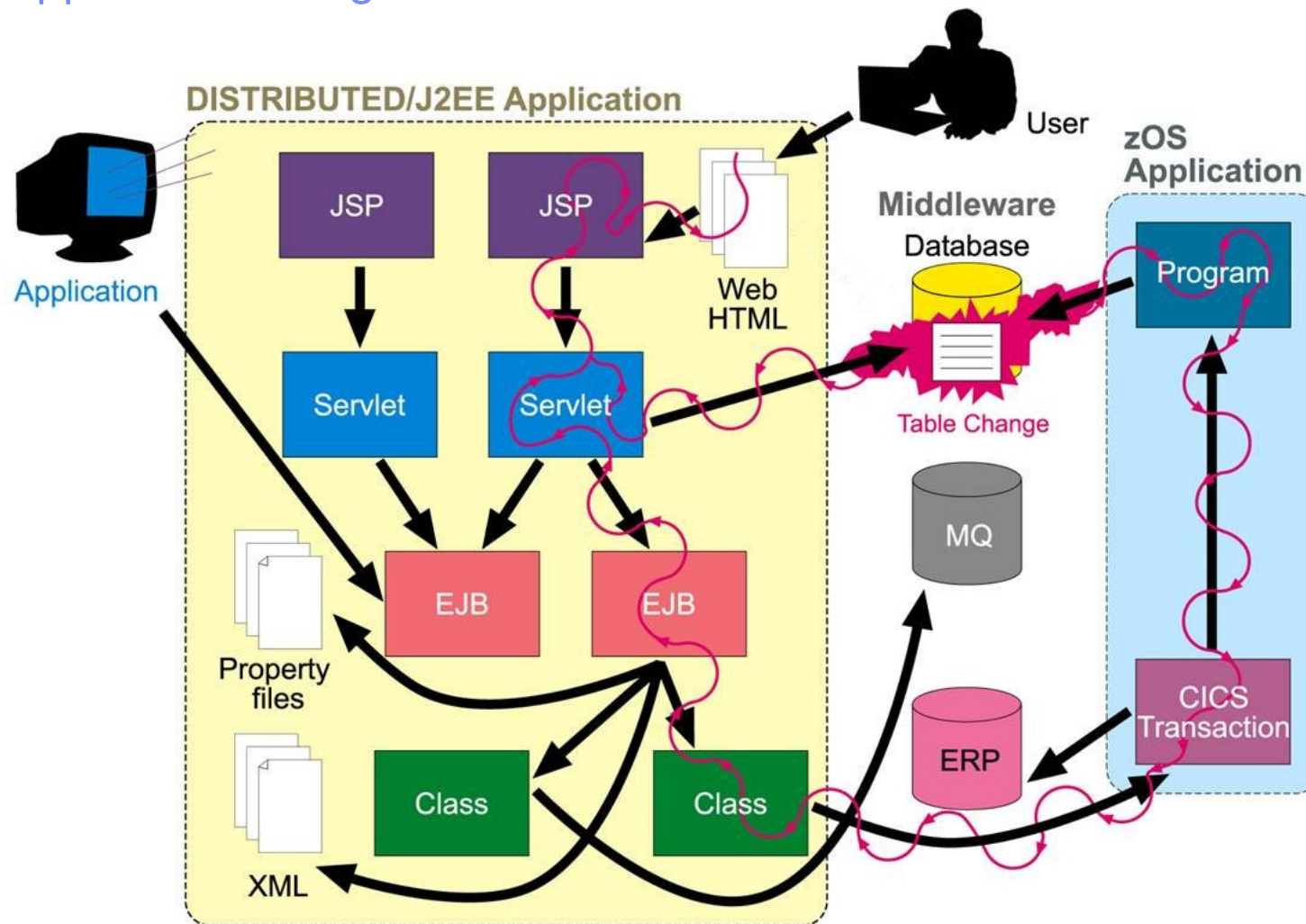
page 1 of 1 | 1 - 3 of 3 | Show groups of 15

Row	Name	Main WSDL file	Endpoint providers implementing this service	Endpoint clients using this service
1	DPHXCMSService	inquireCatalog		DPHXCMSService
2	DPHXCMSService2	inquireSingle		DPHXCMSService2
3	DPHXCMSService3	placeOrder		DPHXCMSService3

page 1 of 1

End-to-End Impact Analysis

What happens if I change a database table?



Newest enhancements

- Improved composite and Web service application support, including the following:
 - ▶ Scanning Web services information and including these in impact analysis results
 - ▶ Automated detection of some composite application relationships, including EJB-QL
 - ▶ Wizard for manually articulating relationships between assets
 - ▶ Support for scanning CICS TS V3.1 Web service constructs in application source code
- Expanded metrics support
 - ▶ New open metrics framework provides a way to plug in custom-written metrics engines or other tools.
- Improved tool integration
 - ▶ Expanded URL application programming interface for mashup-like integrations
 - ▶ Expanded Web service interface for getting data into and out of the WSAA repository
- Updated support of other software products
 - ▶ WebSphere Application Server V6.1 (including on System z)
 - ▶ CICS TS V3.1 (including CHANNEL and CONTAINER support)
 - ▶ Latest syntax in Enterprise COBOL and Enterprise PL/I
- Numerous usability and performance enhancements



WebSphere Developer Asset Analyzer

- Free technology preview with Rational Developer for System z.
- Allows a RDz user to use the asset management functions of WSAW from his workspace.
- Provides:
 - ▶ Automatic scanning of COBOL and PL/I assets on the workstation
 - ▶ Search for declarations of data elements and programs
 - ▶ Search for declarations of data elements from the LPEX editors
 - ▶ Search against remote z/OS hosts
 - ▶ Automatic retrieval of z/OS assets through search results
 - ▶ Impact analysis for data elements

The screenshot displays the WebSphere Developer Asset Analyzer interface. The top window, titled 'WDAA Program View', shows a tree view of assets for 'Program QAD01'. A red arrow points from the 'Show Program Diagram' menu item to the 'WDAA Program Diagram' window, which displays a hierarchical diagram of the program structure. A yellow starburst labeled '2' is placed over the diagram. Below this, the 'WDAA Data Element Table' window is shown, displaying a table of data elements. A yellow starburst labeled '3' is placed over the table. The table has the following columns: Name, Level, Type, PhysicalLength, LogicalLength, InitialValue, and Scale.

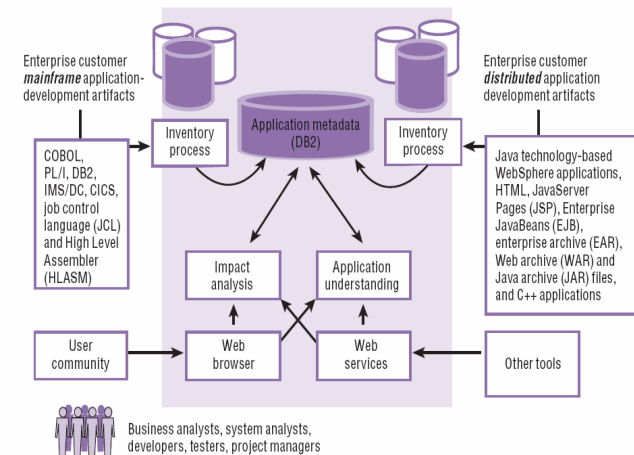
Name	Level	Type	PhysicalLength	LogicalLength	InitialValue	Scale
DELAY-FILE	0	FD	0	0		0
DELAY-STATUS-OK	88	UNKN	2	0	00	0
ENTRYPOINT-PARAMETER-1	1	GRP	120	0		0
ERROR-DATA	5	NUMB	5	5		0
ERROR-DESC	5	CHAR	30	30		0
ERROR-FILE	0	FD	0	0		0
ERROR-REC	1	GRP	35	0		0
ERROR-STATUS-OK	88	UNKN	2	0	00	0
FILLER	5	CHAR	74	74		0
FIRST-NAME	5	CHAR	20	20		0
INP-DELAY-RCP-REC	1	GRP	21	0		0
INP-DRCP-EXPECTED-DT	5	CHAR	6	6		0
INP-DRCP-PART-NO	5	CHAR	4	4		0
INP-DRCP-PENDING-QTY	5	NUMB	5	5		0
INP-DRCP-RECEIVED-DT	5	CHAR	6	6		0
INPUT-FILE	0	FD	0	0		0
INPUT-PART-IN	5	NUMB	3	3		0
INPUT-PART-NO	5	NUMB	4	4		0
INPUT-REC	1	GRP	7	0		0
INPUT-STATUS-OK	88	UNKN	2	0	00	0

Show program diagram



WSAA – Designed for the Enterprise

- Industrial strength scalability
 - ▶ One company's metadata: 200K programs, 140K batch jobs, 126K DB2 columns, 2.4M program literals, 81M data elements
- Web browser client delivers ...
 - ▶ Simple user interface
 - ▶ Low admin & incremental user cost
- Open architecture enables customization & integration
 - ▶ Data in DB2; documented data model
 - ▶ Add your own tables to customize
 - ▶ Web services interface for tool integration
 - ▶ Custom queries - interactive or batch
- Language coverage
 - ▶ Strong COBOL & PL/I support
 - ▶ Building out Java – mainframe support



- Integration with other tools – today and in the future
 - ▶ Rational Developer for System z
 - ▶ Rational Transformation Workbench
 - ▶ CICS Interdependency Analyzer
 - ▶ Tivoli Application Dependency Discovery Manager / CCMDB
 - ▶ Others
- Built on the WebSphere Application Server & DB2



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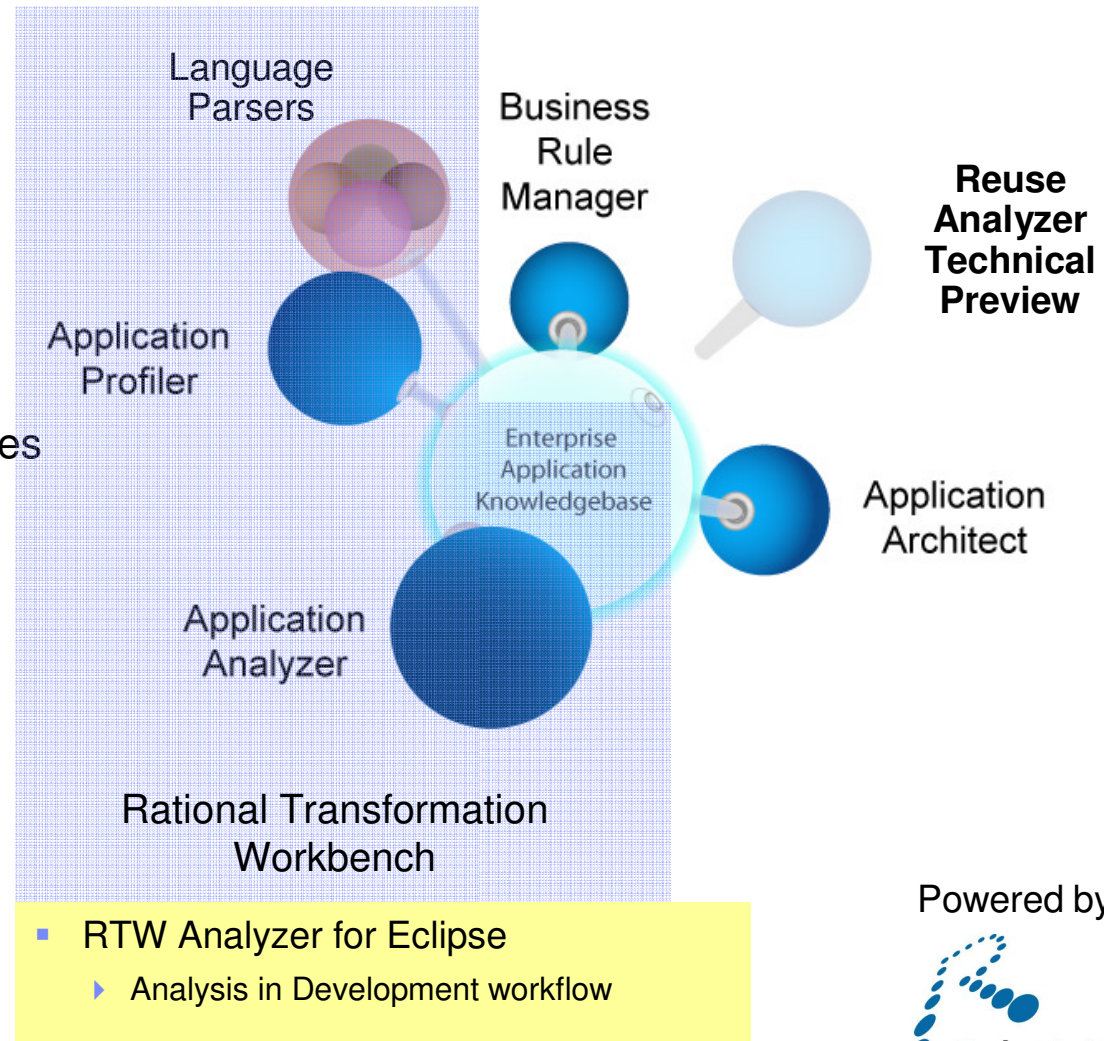
Common IDE for COBOL, PL/I, Java and Web services applications (Program analysis)

**Rational Developer for System z
RTW Analyzer for Eclipse/WDAA**



RTW – Pieces and functions

- Application Analyzer
 - ▶ Deep interactive analysis
- Application Profiler
 - ▶ Team access via the web
- Business Rule Manager
 - ▶ Find and manage business rules
- Application Architect
 - ▶ Create new, reusable components
- Reuse Analyzer Technical Preview
 - ▶ Analyze code for SOA
- RTW Analyzer for Eclipse
 - ▶ Analysis in Development workflow



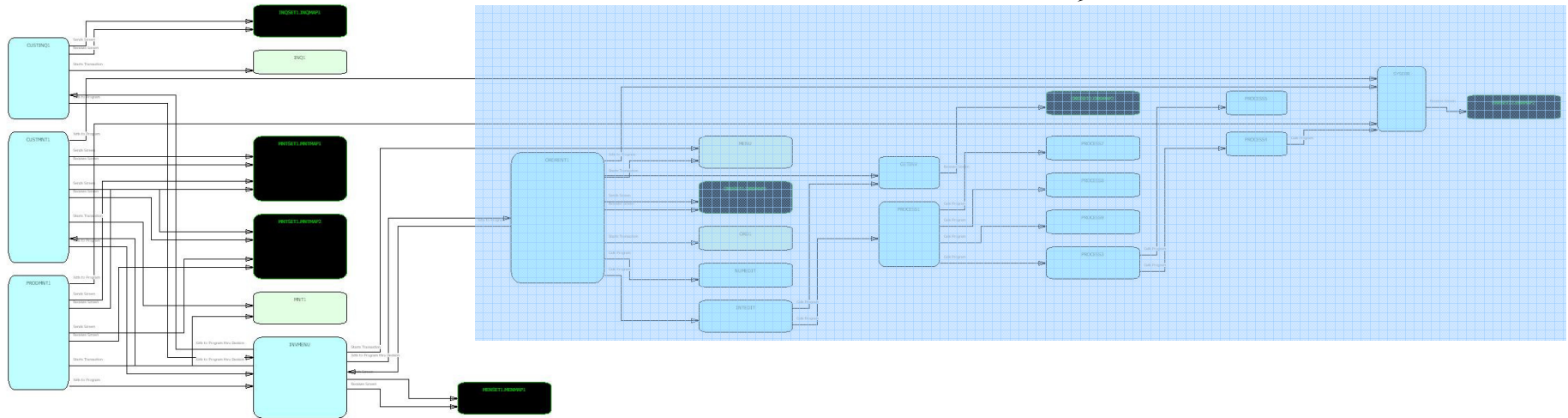
Powered by

Relativity
TECHNOLOGIES

Identify Application Components for Services

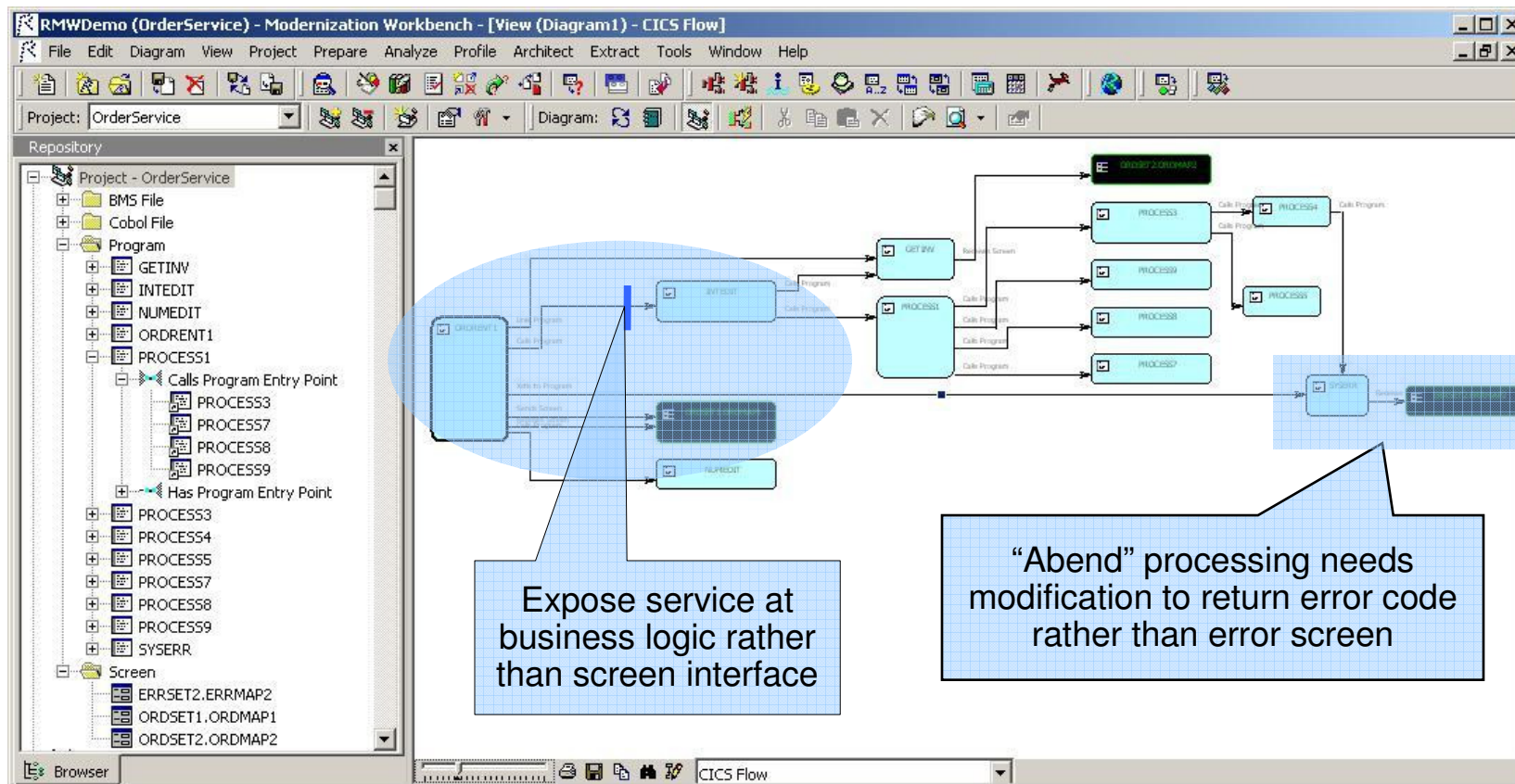
- RTW's application visualizations enable rapid identification application artifacts involved in desired services
- Pertinent artifacts can be logically separated for deeper analysis and service exposure

Programs, screens, and transactions involved in business process of interest



Rapid Assessment of Service Viability

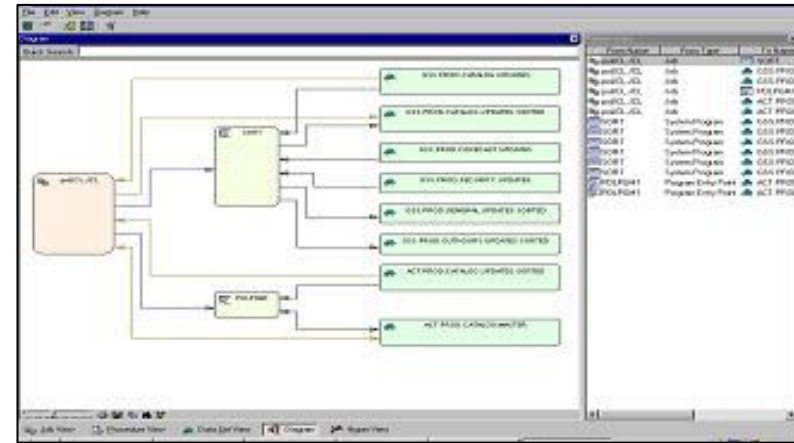
- Where should the service begin?
- Are there any “traps” that could lead to errors?



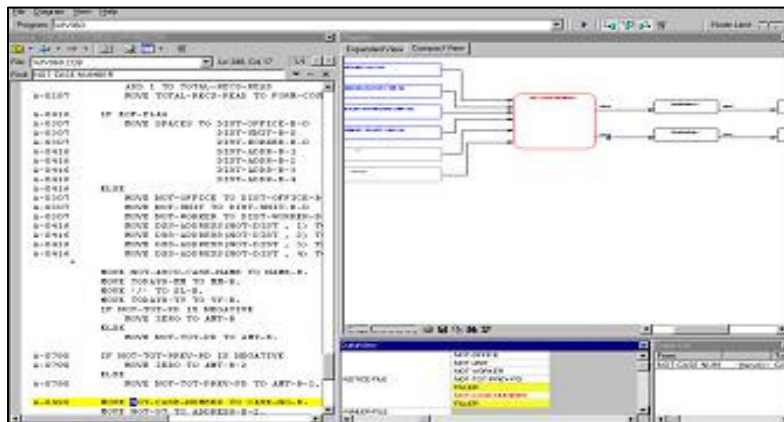
Application Analyzer: Screen Shots

Name	Type	Executable Size	Operations	Operands	Vocabulary	Program Vols.	Complex.	Devel.
OE4211	Program	3747	6229	14343	8728	267177.30	0.06	243280.68
OE4001	Program	4599	5774	15462	8006	288338.30	0.05	254529.00
OE4202	Program	3227	5147	12058	7188	226317.20	0.06	196446.50
OE4214	Program	2920	4642	9474	5049	173652.00	0.07	145279.30
WBFWB	Program	1925	3671	8970	4149	152407.20	0.09	90712.17
BL0412	Program	1620	4089	17916	11964	297682.40	0.10	173560.96
WBFWB	Program	1637	3489	8150	3997	137877.50	0.10	80003.38
OE4208	Program	1677	3255	8083	5913	157082.80	0.07	119083.11
OE4203	Program	1710	2879	6375	3462	108802.90	0.07	83843.24
WBG1BL	Program	4261	5725	13808	6600	248966.90	0.06	248547.70
WBG1BL	Program	1504	2744	5778	2726	57257.92	0.07	74798.62
OE4201	Program	2127	3323	6080	3664	111442.40	0.07	82695.72
OE4800	Program	2289	3316	7118	3803	124080.80	0.07	109682.00
BL0091	Program	995	1932	9078	6438	136302.90	0.12	87597.68
OE4205	Program	1223	2087	4685	2548	74689.47	0.07	60830.32
BL0409	Program	598	1840	7712	5528	118755.60	0.10	64592.28
OE4204	Program	1102	1987	3749	2122	62434.50	0.06	95662.96
OE9002	Program	1920	2640	5446	2728	52290.68	0.07	77792.31
WV7830	Program	3195	4101	9038	4966	197727.10	0.06	141072.30
OE4223	Program	1290	2182	4629	2851	77263.98	0.07	99596.96

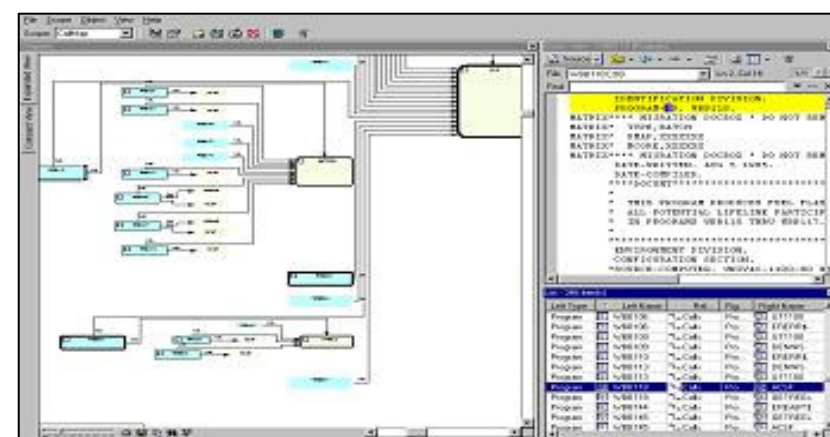
Complexity Report



Batch Application Viewer



Global Data Flow Analysis



Call Map Diagrammer



Rational Transformation Workbench Business Rule Manager™

- **Accelerated business rule discovery**
 - Sophisticated tools help to **quickly identify rules**
 - Powerful interrogation **simplify manual searches**
 - Creation of rules directly from a search screen **accelerates the collection process**

- **Powerful business rule management**
 - Persistence ensures that **rules are not lost** as programs change
 - Rules Filter helps to **focus business rule searches**
 - Analysts can **categorize and describe** their portfolio of business rules, simplifying ongoing usage

- **Integrated approach magnifies benefits**
 - Rich diagramming and search functions help users to **focus searches**
 - Convenient reports help analysts to **plan, manage, and share** business rules
 - **Browser-based access** allows users to remotely search, audit and annotate the latest business logic



Rational Transformation Workbench Application Architect™

- **Flexibility and reuse with componentization**

 - Componentization tools enable the creation of **more reusable and maintainable** programs
 - Examines all dependencies to ensure that the extraction is a **functionally complete** component
 - Coverage Report identifies additional opportunities and **ensures completeness**

- **Reduced complexity with application renovation**

 - **Reduces complexity by partitioning** business logic, data access, and user interfaces
 - **Ensures compliance** with corporate standards by propagating naming conventions
 - Eliminates dead, redundant, and duplicate code to **reduce complexity and enhance maintainability**

- **Extend applications through Web services**

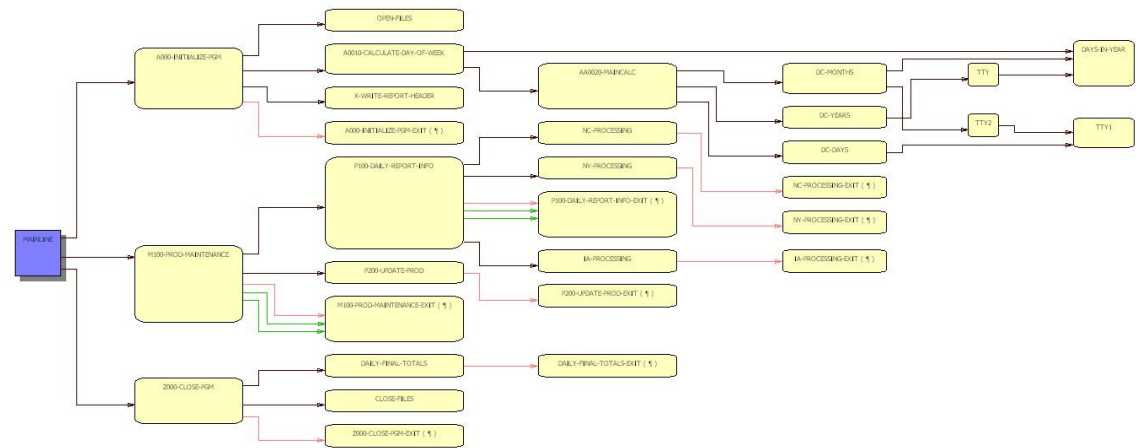
 - **Accelerates the alignment** of application components in a Service Oriented Architecture



Reduce complexity and remove obsolete code

Benefits

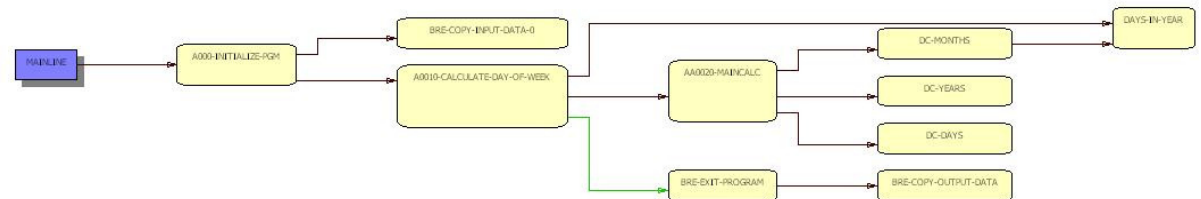
- ▶ Reduce “application entropy”
- ▶ Speed up future maintenance
- ▶ Improve quality of future changes
- ▶ Reduces Risk of errors or failures based on unexpected processing paths



Before Renovation



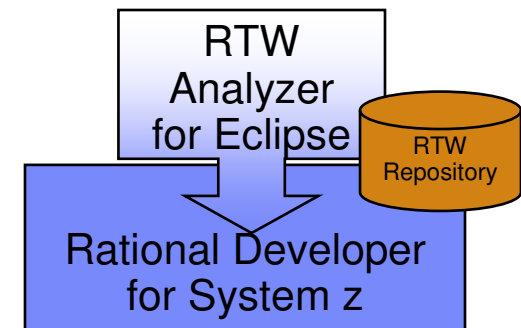
After Renovation



RTW Analyzer for Eclipse

Analysis Integrated into the Development Workflow

- Analyze source in RDz local and remote z/OS projects
 - ▶ Programs
 - also JCL, DDLs, PSB and DBD files, and IDMS schemas
 - ▶ Automatic analysis of project source
 - creating a repository that is the basis for analysis
 - ▶ Automatic resolution of dynamic calls
 - to programs, files, screens, etc.
- Mechanism for synchronizing the sources for analysis with changes occurring in an ongoing maintenance and enhancement environment

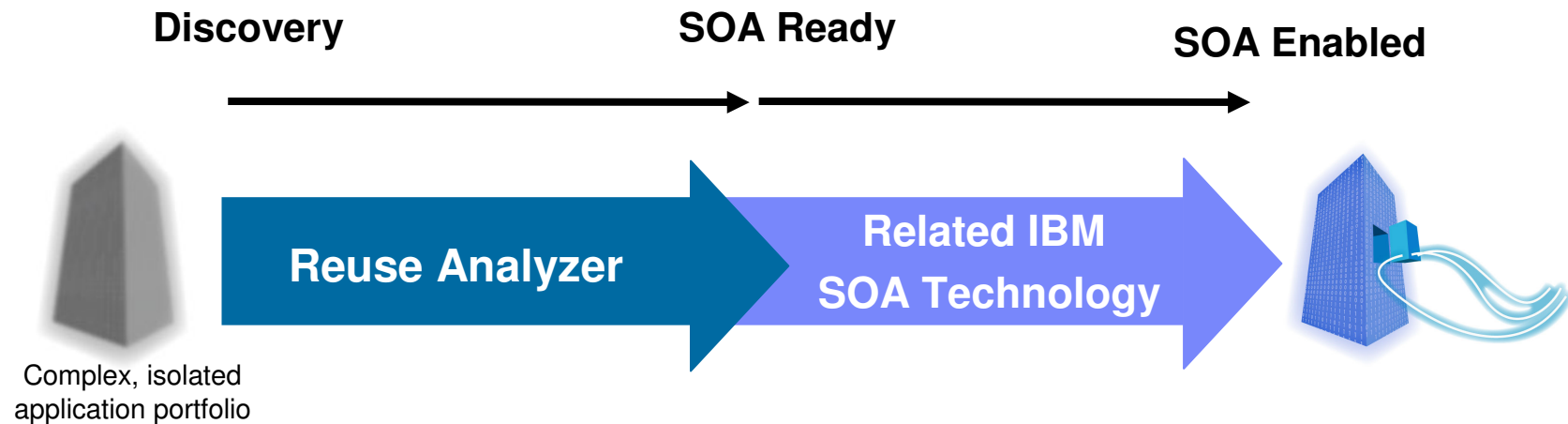


Navigate program source via synchronized views

The screenshot displays the Rational software interface with several synchronized views:

- Repository Browser (top-left):** Shows a project tree with files like INVMENU.ccp, NUMEDIT.cbl, and ORDRENT1.ccp. The ORDRENT1.ccp file is expanded to show its structure, including 'Defines Program' and various entry points.
- Code Editor (top-middle):** Displays the source code for ORDRENT1.ccp. The code includes sections for 'END-PERFORM', '1400-SEND-ORDER-MAP', and 'IF SEND-ERASE'. A blue box highlights the 'EXEC CICS' block within the 'IF SEND-ERASE' section.
- Logic flow (top-right):** A flowchart showing the execution logic of the code. It starts with 'IF SET-ATTRIBU...', branches into '1410-SET-AT...', 'IF RESET-ATTRI...', and '1420-RESET-...'. It then flows through 'CONTINUE', 'IF SEND-ERASE', and 'SEND...' blocks. A light blue box labeled 'Logic flow' is overlaid on this view.
- Outline (bottom-left):** A detailed outline of the program structure, listing various steps like '1100-RECEIVE-ORDER-MAP', '1200-EDIT-ORDER-DATA', and '1400-SEND-ORDER-MAP'. A light blue box labeled 'Context' is overlaid on this view.
- Control flow (bottom-right):** A high-level control flow diagram showing the relationship between different program components. It includes boxes for '0000-ENTER-ORDERS', '3000-SEND-TOTAL-LINE', '2000-PROCESS-POST-ORDER', '2100-WRITE-INVOICE-RECORD', and '1400-SEND-ORDER-MAP'. Arrows indicate the flow of control between these components. A light blue box labeled 'Control flow' is overlaid on this view.

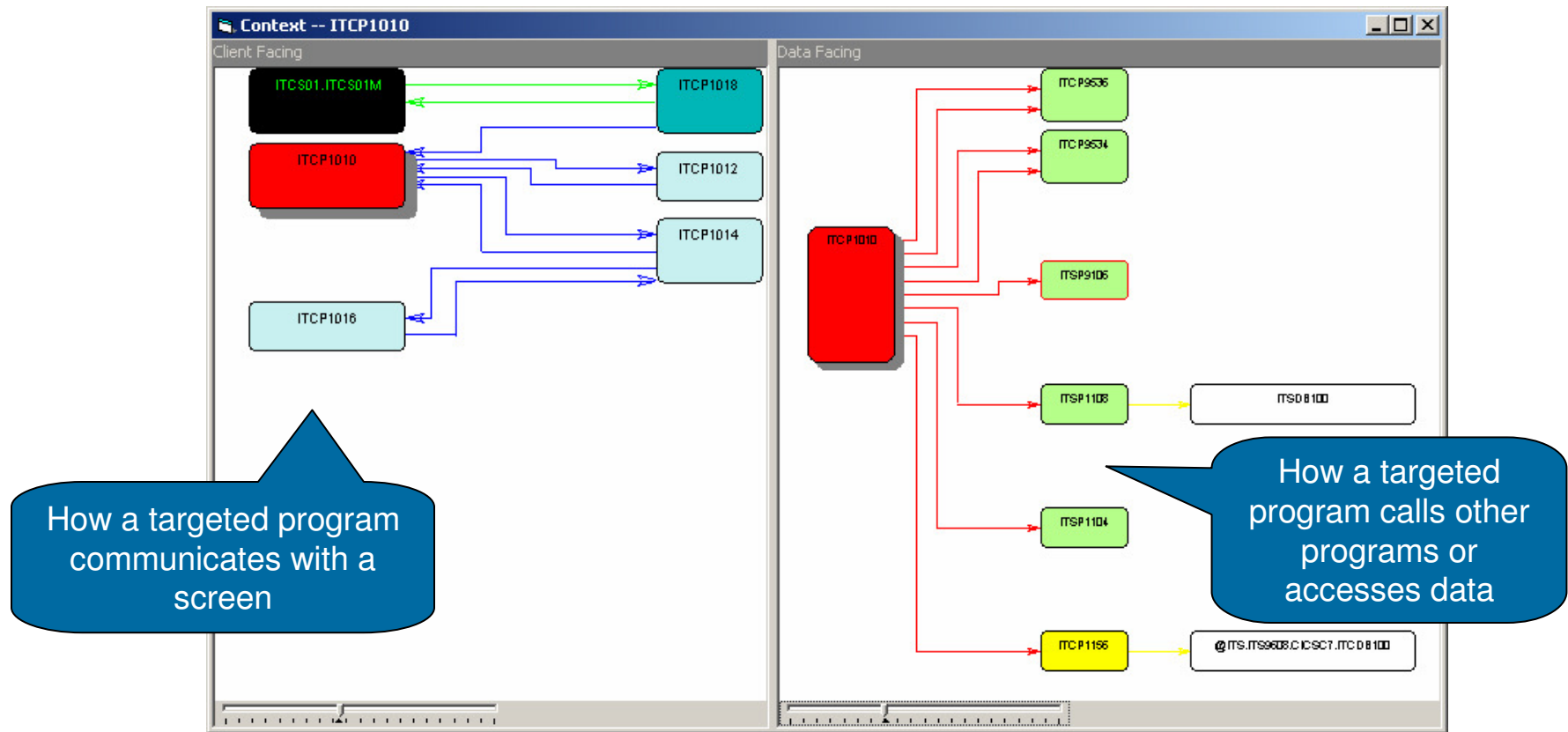
Reuse Analyzer for RTW Technical Preview



1. Discover candidates for reuse by analyzing the RTW repository
2. Identify hidden architectural traps
3. Accelerate remediations
4. Generate specifications as WSDL



Discovery Context of Targeted Programs



Analysts can view the context of targeted elements, in this case a 'transitional' program (in red), from a client-facing and data-facing perspective



Reuse Analyzer: Assessment Report

Summary Report

CRUD Overlap Report

Program One	Degree of Similarity	Program Two
DISC9000	100%	ITCP9002
DISC9001	82%	ITCP9198
DISC9003	100%	ITCP9276
DISC9003	100%	ITCP9454
DISC9004	100%	ITCP9018
DISC9004	100%	ITCP9032
DISC9004	100%	ITCP9040
DISC9004	100%	ITCP9090
DISC9004	100%	ITCP9158
DISC9004	100%	ITCP9222
DISC9004	100%	ITCP9362
DISC9004	100%	ITCP9514
DISC9004	100%	ITCP9520
DISC9005	100%	ITCP9412
ITAA9006	100%	ITAA9008
ITBP9114	100%	ITCP9114
ITBP9416	88%	ITCP2160
ITBP9416	89%	ITCP2214
ITBP9416	100%	ITCP9416
ITCC9120	100%	ITCV9120

Summary of findings

Inventory

- Screens: 68
- Programs: 61
- Data Stores: 21

Regular architecture

- Client facing: 38
- Transitional: 6*
- Frontier: 27*
- Data Access: 3
- Data Logic: 1
- Logic Only: 24
- Batch: 479*

Irregular architecture

- Client Facing Mixed: 5
- Client Facing Called: 3
- Transitional Called: 2
- No Category: 0

Context Diagram

Client Facing Diagram

```

    graph LR
      ITC9000[ITC9000] <--> ITC1122[ITCP1122]
  
```

Data Facing Diagram

```

    graph LR
      ITC1122[ITCP1122] --> ITC1156[ITCP1156]
      ITC1122 --> ITC1120[ITCP1120]
      ITC1122 --> ITC1180[ITCP1180]
      ITC1122 --> ITC1154[ITCP1154]
      ITC1156 --> DB100["@ITS.ITS9608.CICSC7.ITCDB100"]
      ITC1120 --> DB100
      ITC1120 --> DB100
      ITC1120 --> DB100
      ITC1120 --> DB100
      ITC1180 --> DB100
      ITC1154 --> DB100
      ITC1156 --> DB1000["@ITS.ITS9608.CICSC7.ITCDB1000"]
      ITC1120 --> DB1000
      ITC1180 --> DB1000
      ITC1154 --> DB1000
      ITC1156 --> DB10000["@ITS.ITS9611.CICSC7.ITCDB10000"]
      ITC1120 --> DB10000
      ITC1180 --> DB10000
      ITC1154 --> DB10000
  
```

The browser-based report allows users to navigate through inventories, recommended remediations and other information to determine how to proceed

Common Scenarios for RTW and WSAA

- Document an application
 - ▶ Compliance, team documentation
 - ▶ “Fact-based” conversations with outsourcing partner
 - ▶ Manage application complexity
- Learn an application faster
- Analyze to make changes
 - ▶ Faster, better quality changes, better project estimates
- Renovate
 - ▶ Remove dead & obsolete code
 - ▶ Restructure and simplify
 - ▶ Lower maintenance costs
- Transform for business value
 - ▶ Faster time-to-market
 - ▶ Componentize for reuse
 - ▶ Reuse business rules
- Many other reasons!



WSAA & RTW – some usage scenarios

Usage Scenarios	WSAA	RTW
Work with z/OS Assets		
Cobol , PL/I, JCL	Y	Y
CICS, IMS, DB2	Y	Y
Assembler	Y	Y
Natural / Adabas		Y
Micro Focus COBOL, ACUCOBOL GT		Y
Work with Distributed Assets		
Java, J2EE, WebSphere	Y	
XML, C/C++	P	



WSAA & RTW – some usage scenarios

Usage Scenarios	WSAA	RTW
Understand Application		
New developer	Y	Y
Outsourced development or operations	Y	Y
Application Maintenance / Change Request	Y	Y
Compliance documentation	Y	Y
Find and manage business rules	P	Y
Find business processes for reuse	Y	Y
Find programs & data needed for testing	Y	Y



WSAA & RTW – some usage scenarios *(continued)*

Usage Scenarios	WSAA	RTW
Reduce Risk due to Changes		
Identify downstream impact	Y	Y
Project-level (millions of LOC)	Y	Y
Enterprise-wide (tens of millions of LOC)	Y	
Transform Application		
Improve Code Maintenance		
Reduce Complexity		
Refactor/restructure code/ code slicing	P	Y
Remove dead code	P	Y
Make more accurate project estimates	Y	Y
Find programs & data needed for testing	Y	Y
Assess programs for reuse and suggest remediations	P	Y



WSAA & RTW – some usage scenarios *(continued)*

Usage Scenarios	WSAA	RTW
Deployment		
Use anywhere from browser	Y	Static reports and bus. rule management
Run on z/OS	Y	
Scan source where it lives	Y	
Scan CICS, IMS, DB2, and WebSphere system configurations	Y	P
Run on workstation		Y



Futures...



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EM Sandbox for System z Tinker and Play with the products

System z Sandbox

Launched February 26th

Examples and best practices provide low-risk, practical, hands-on path to understanding



- Rational Developer for System z
- Rational Business Developer
- Rational Transformation Workbench
- Rational Host Access Transformation Services

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QUESTIONS

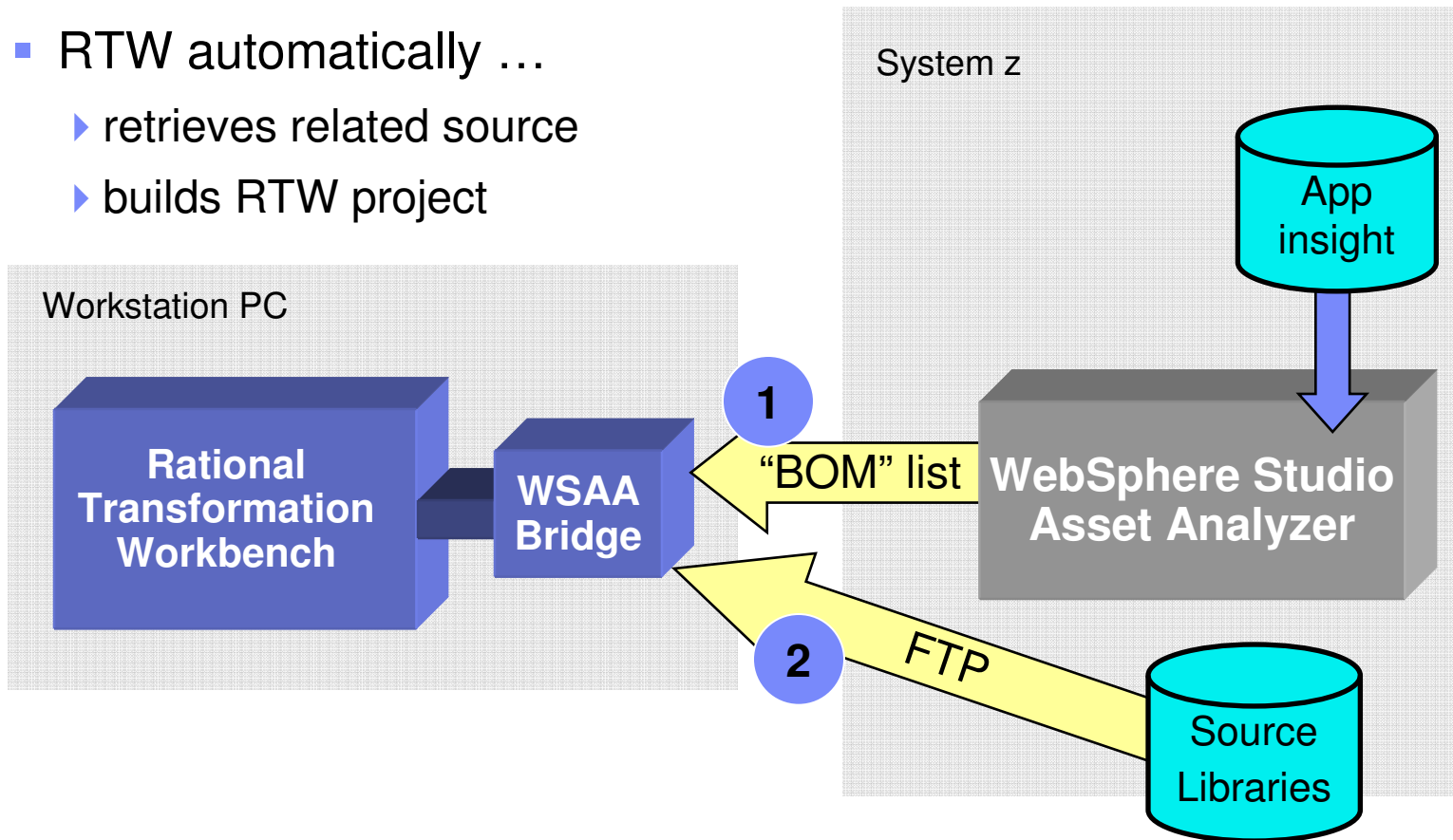


Backup



WSAA Bridge – part of RTW V2.1

- Find an interesting set of enterprise assets in WSAA
- Download the results as a “Bill of Materials” (BOM) to RTW
- RTW automatically ...
 - ▶ retrieves related source
 - ▶ builds RTW project



WSAA bridge – more detail

- Uses WSAA's Web service interface to retrieve Bill of Materials
 - ▶ includes asset name and location in PDS or library system
- Gets the source assets
 - ▶ Uses FTP to get files from mainframe
 - ▶ Or gets relevant files from “staging area”
 - Provides way for user to get files
 - Staging area can be anywhere accessible by Windows file system (local or remote)
 - ▶ Builds project in the local RTW workspace (repository)
 - ▶ Note: some interesting files will probably need to be manually retrieved from the mainframe and loaded into the workspace
 - e.g., CICS CSDs, DB2 DDL



Screen shot

