IBM Software Group - WebSphere

Application Discovery and Reuse of Mainframe Applications for SOA

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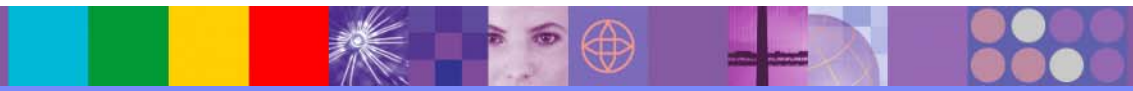


Agenda

- Introduction
- Today's development challenges
- How can you identify reuse candidates?
- WebSphere Studio Asset Analyzer
- Asset Transformation Workbench
- Summary
- Q/A

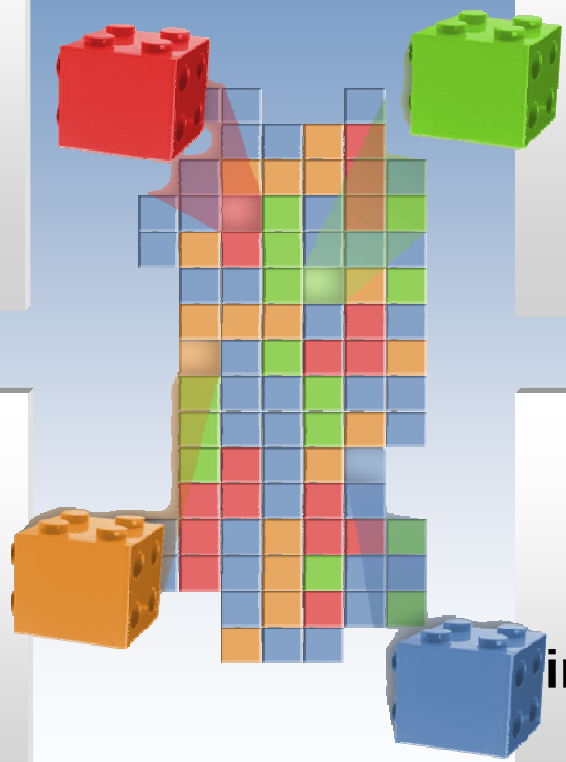
IBM's view of SOA

… a service?

A **repeatable business task** – e.g., check customer credit; open new account

… service orientation?

A way of integrating your **business as linked services** and the outcomes that they bring



… service oriented architecture (SOA)?

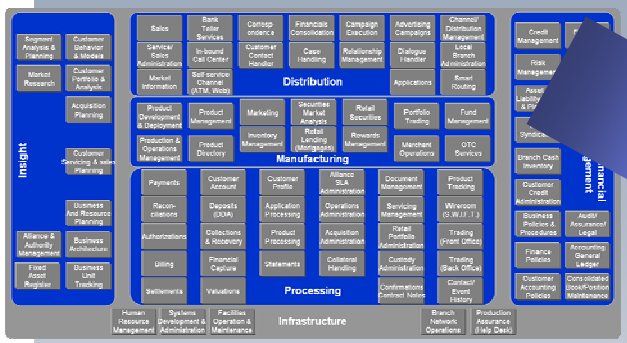
An IT **architectural style** that supports service orientation

… a composite application?

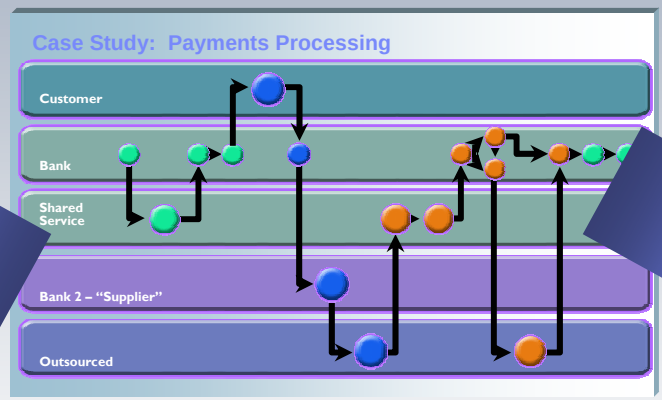
A set of **related & integrated** services that support a business process built on an SOA

Flexible business requires flexible IT

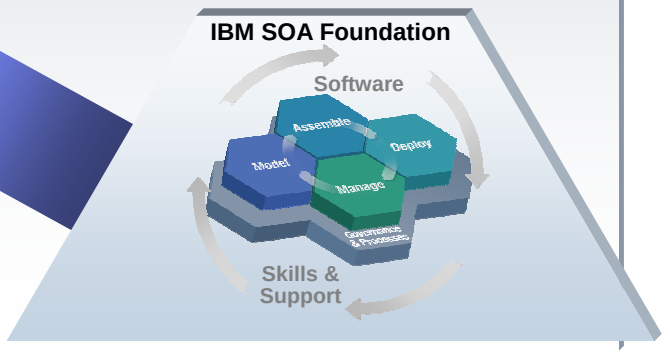
Full Business view



Process to optimize

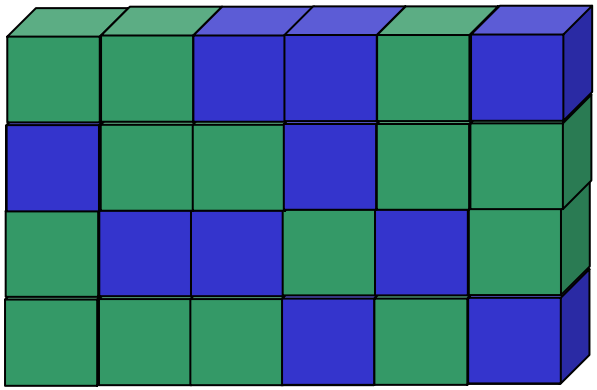


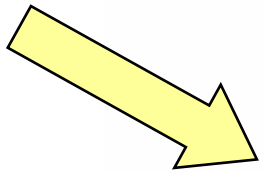
Creating IT flexibility

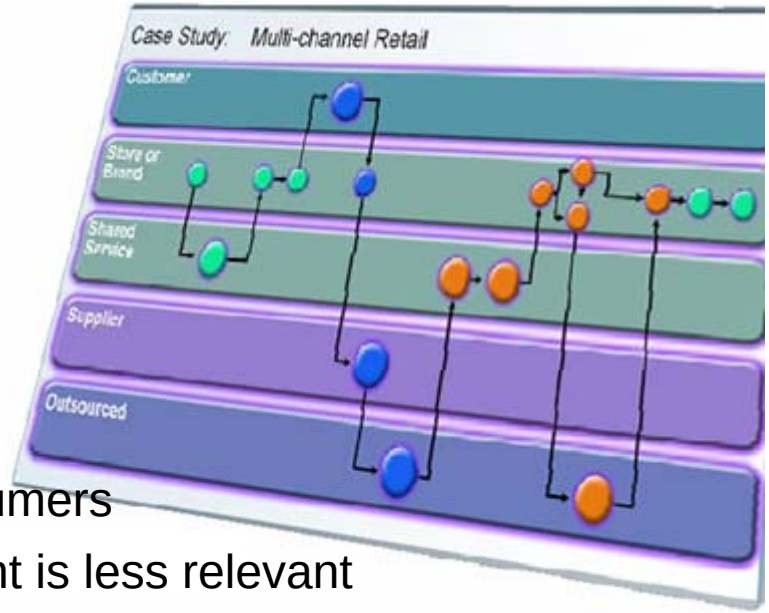


Why SOA for Business Flexibility and Reuse?

Composite Application

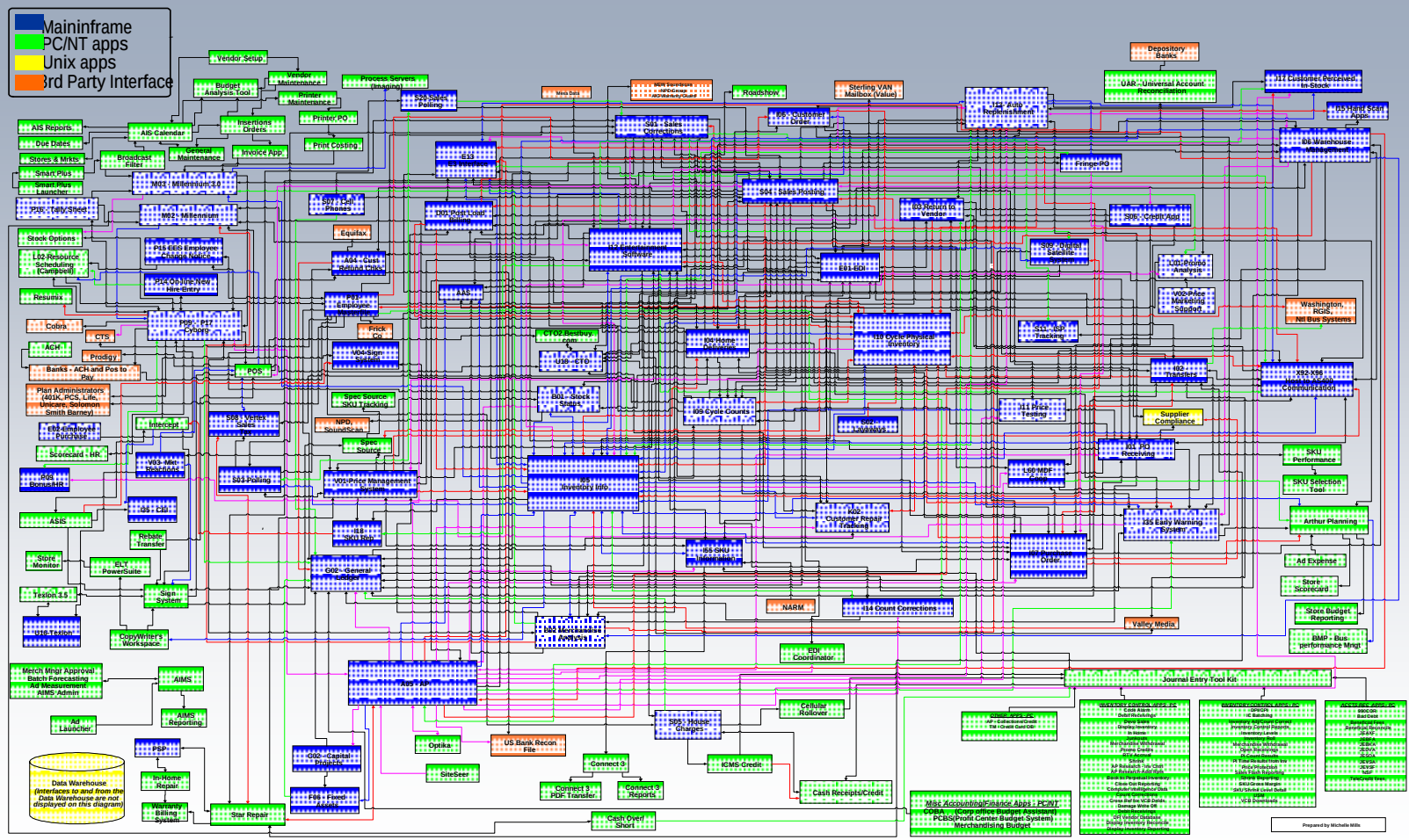






- Standardized view to business process consumers
- The technology underpinning each component is less relevant
- Individual components can be re-engineered, replaced, re-platformed to meet optimal parameters (SLA, cost, performance, etc.)
- New applications can be composed out of existing, proven components

Application Complexity – The Reality



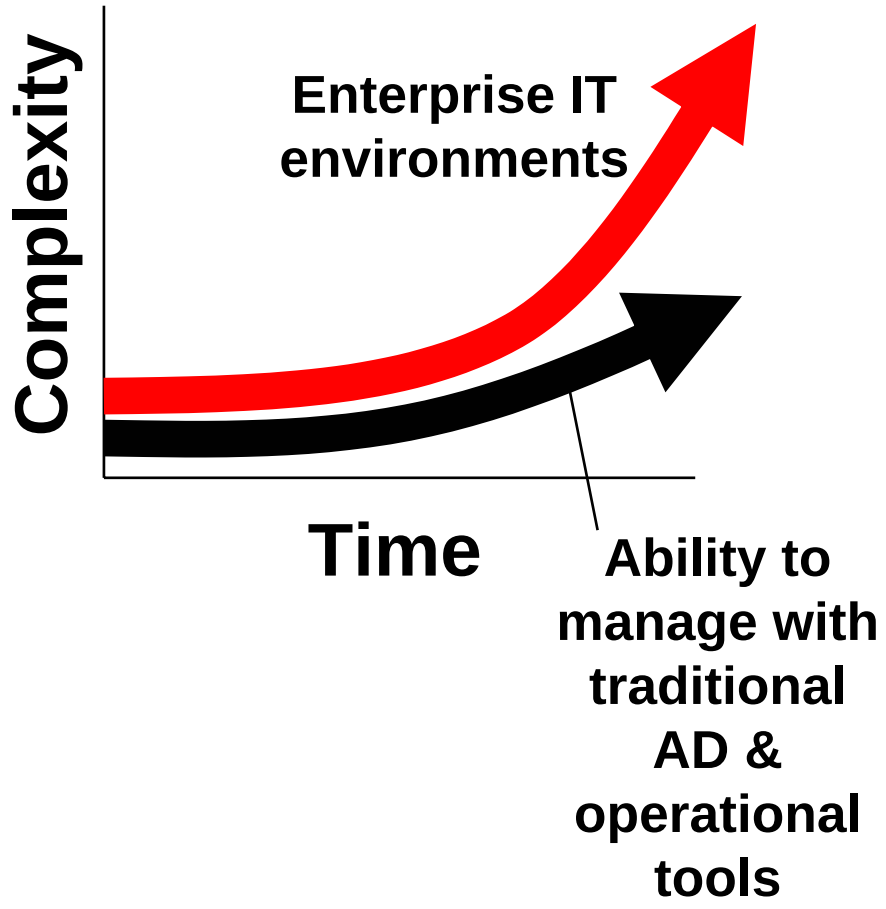
Actual Application Architecture for Consumer Electronics Company

What impact does this complexity have on application development?

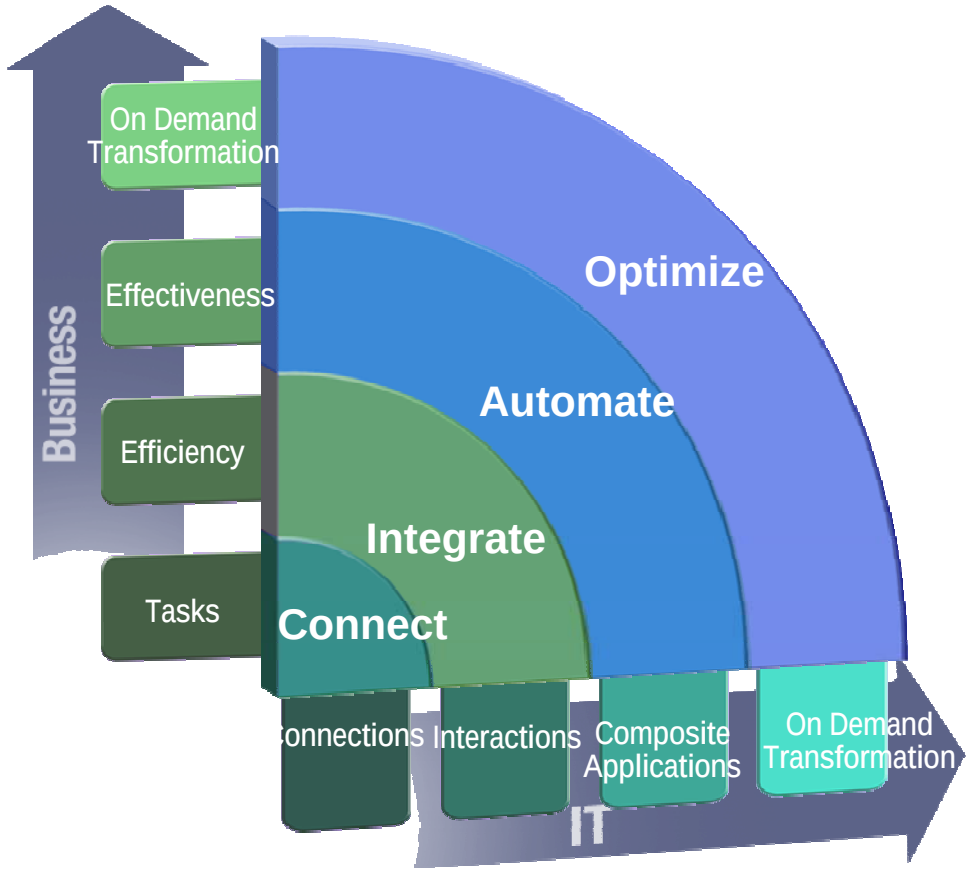
Complexity makes…

- Operations more difficult & costly
  - Harder to understand the applications that make up a large code base
    - New developers,consultants, contractors,
  - Takes longer to make any code changes/extensions/maintenance
    - New application projects (like SOA)
- Outages more likely
  - Code change – have all impacted assets been identified
- Change more difficult & costly
  - Where are the business rules? Which ones should be restructured, moved to another platform, consolidated with others, etc.?

- **Reduce risk with improved understanding and control of business logic, business processes, and application dependencies**

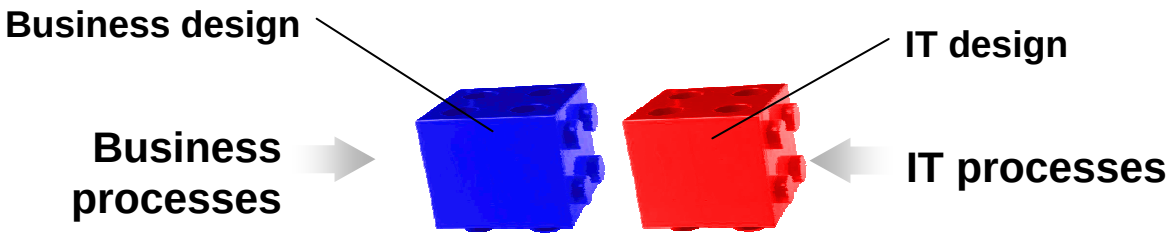


Start with your business. Develop a step by step plan. This is an evolutionary, not revolutionary process.

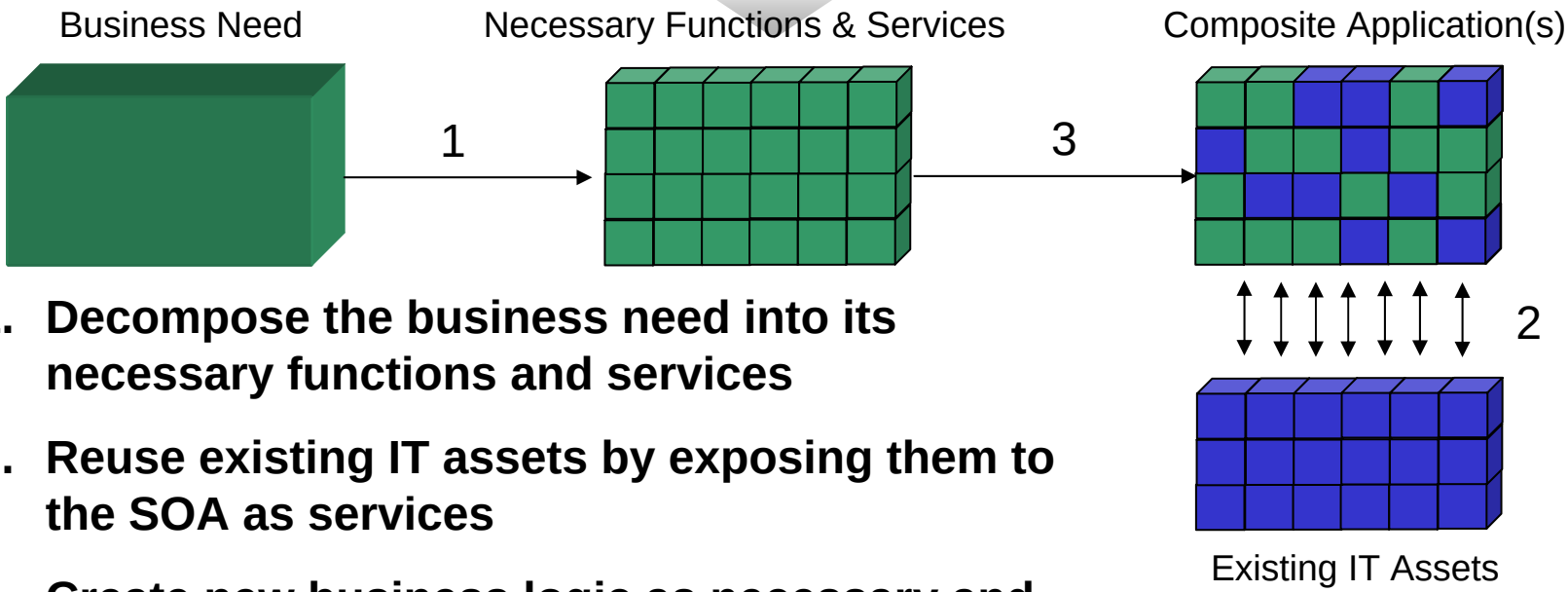


Each step building on the previous … moving you forward as an on demand business

Reusing existing assets is key



Aligning business with IT



1. **Decompose the business need into its necessary functions and services**
2. **Reuse existing IT assets by exposing them to the SOA as services**
3. **Create new business logic as necessary and integrate with newly exposed “existing IT” services**

Creating SOA composite applications with existing assets

Model

Model a new business process that builds on your current capabilities …..

WebSphere Business Modeler

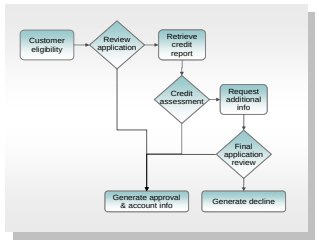
…and discover program units and business rules you can reuse in the new process.

WebSphere Studio Asset Analyzer/Asset Transformation Workbench

Assemble

Wrap programs as services, creating composite appl'ns from core assets….

WebSphere Developer for zSeries, *plus Service Flow Modeler*



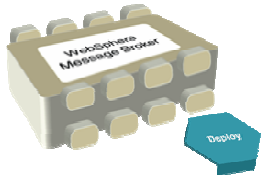
… and assemble the services across multiple platforms

WebSphere Integration Developer

Deploy

Choreograph and deploy your new composite applications ….

WebSphere Process Server



… using an advanced ESB to power your SOA

WebSphere Message Broker

Manage

Monitor the processes across your SOA, and intervene if necessary ….

WebSphere Business Monitor

…. and export data for analysis and process improvement, back to ….

WebSphere Business Modeler

Customer Situation – Adapt systems for new business opportunity, first of several expansion projects

- **Global manufacturer:**
  - **Background**
    - Current product accessories system written consists of IMS transactions and databases
  - **Challenge:**
    - Need to expand existing systems so they can offer more, higher-margin accessories
    - Need to make it easier for dealerships to understand and use system

- **IBM Solution:**
  - Impact Analysis using WSAA & ATW
  - Componentize commonly used business functions using ATW and invoke using WMQ
  - Replace homegrown messaging with WMQ and WMQ-MB as foundation for ESB
  - Incorporate HATS for dealerships
  - WDz for more productive traditional development
  - Utilized IGS Legacy Transformation Services

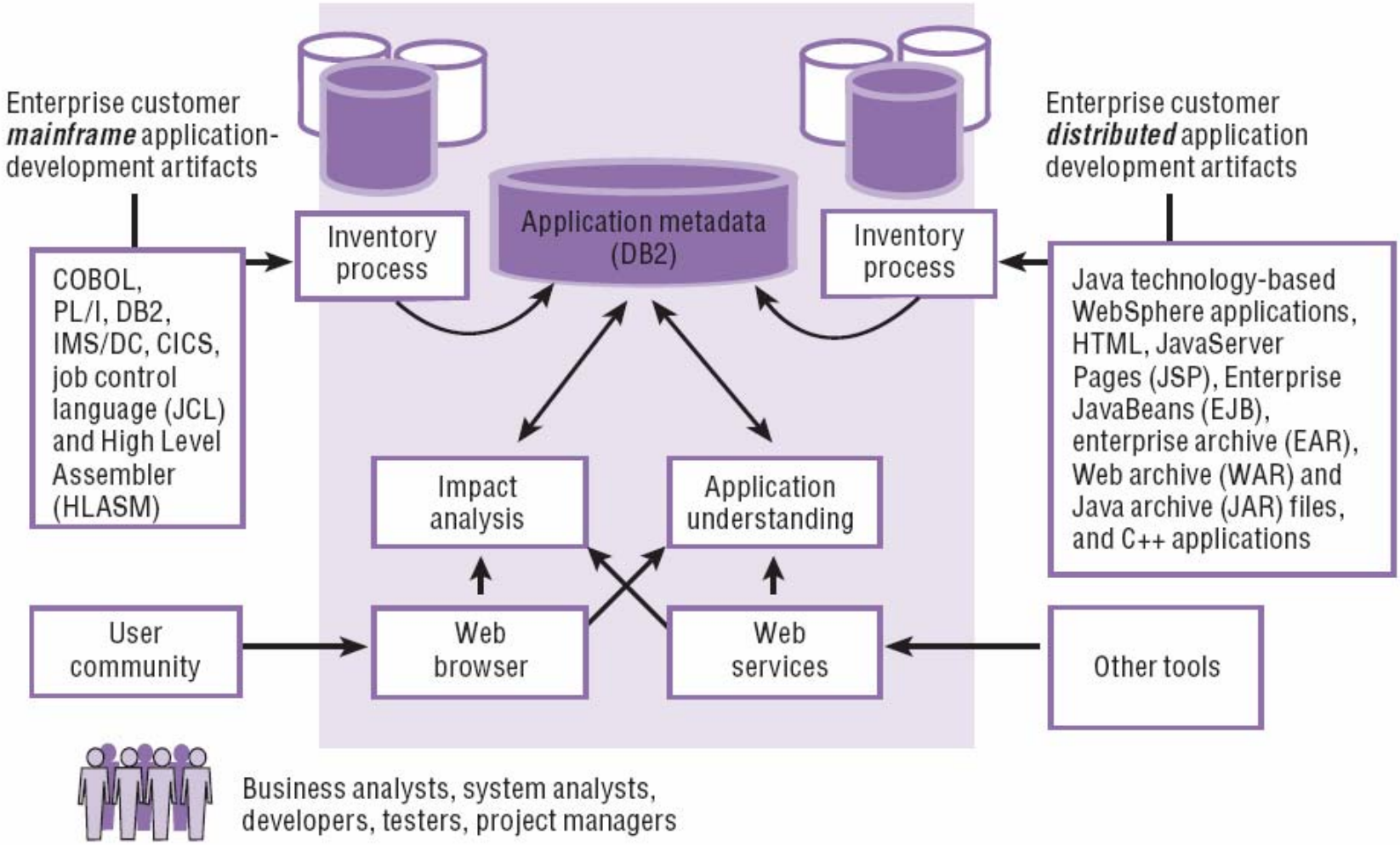
Two tools – how can they help

For migration to SOA projects:

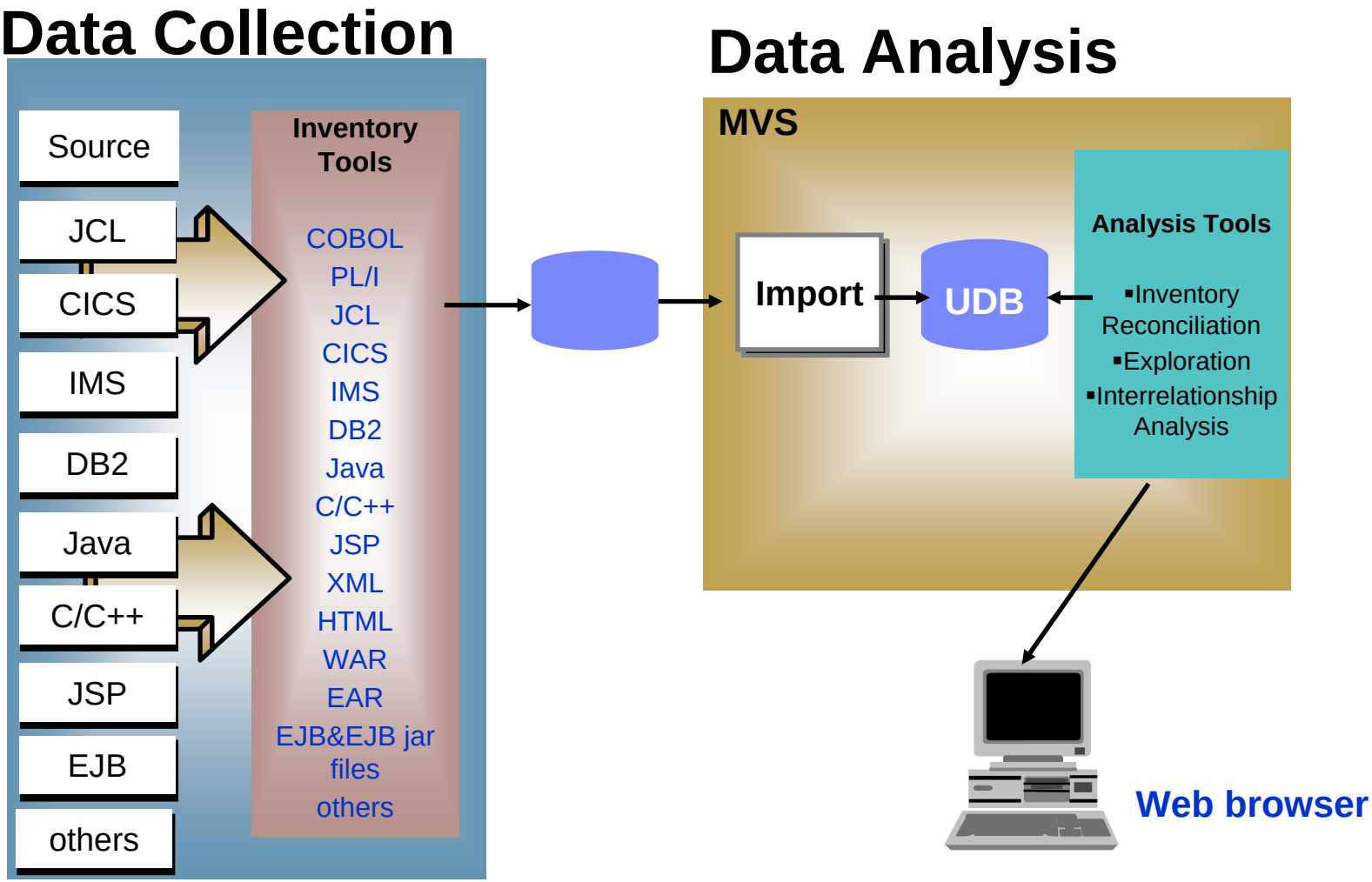
- Use WebSphere Studio Asset Analyzer
  - For enterprise wide understanding of existing mainframe and distributed applications
  - End to end impact analysis of composite applications
  - Understand the complexity of mainframe applications
  - Identify candidates for SOA projects
- Use ATW
  - Project based work
  - Componentize application code for web service

Additional benefits?

WebSphere Studio Asset Analyzer V4.2



Gathering Application Metadata



Exploring assets

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

Explore MVS assets

Actions: Select an Action

Explore MVS assets: QA* Go Type mixed case Advanced search

Run time	Total
Batch job	29
CICS group	2
CICS online region	1
CICS transaction	4
DB2 system	2
IMS DBD	0
IMS subsystem	0
IMS transaction	0
Run unit	

Program	Total
BMS map definition	1
BMS map set definition	1
Concatenation set	1
DB2 stored procedure	0
Entry point	25
IMS PSB	0
Literal	936
Program	16

Data	Total
Data element	2952
Data set	140
Data store	70
DB2 column	9
DB2 table	2
DD name	899
I/O record description	125

Explore distributed assets

Actions: Select an action

Search names: Go Ignore case Advanced search

Containers	Total
Archive file	54
EAR file	8
WAR file	24
EJB-JAR	21
J2EE client file	7
Connector archive	4

Java	Total
Java package	340
Java bytecode class	3228
Java bytecode method	28242
Java bytecode field	18906
Java source class	288

Web	Total
EJB	59
HTML file	657
JSP file	253
XML file	88
Servlet	60
JSP tag	306
JSP tag library	24
Tag library validator	6
Servlet event listener	5
Filter	12

Other	Total
Archive manifest file	122
C++	118
Text file	91
User input asset	10
Unresolved asset	0
Generic asset	122

WebSphere app server	Total
Application server	0
Generic server	0
J2C connection factory	0
J2C resource adapter	0
JMS connection factory	0
JMS destination	0
Cell	0
Clone	0
Datasource	0
JDBC driver	0
JMS provider	0
Mail session	0
Node	0
Server group	0
URL	0
URL provider	0
Virtual host	0

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

Program details

Program details

Actions: Select an Action

Details

File:	DMHSRC13
Program:	QAD01
Language/type:	COB / Program source
Scan parameters for COBOL:	WSAA PROPRIETARY SCANNER:
Analysis status:	Completed
Number of lines in file:	399
Blank lines:	0
Comment lines:	46
Noncomment lines:	353
Number of lines in program:	518
Splitting nodes:	47
Site:	WDRP2K.svl.ibm.com
Container:	NTFS C:\DMH\SAMPLE\SOURCE
Data base updated:	3/21/05 8:33 AM by WSAA1
Concatenation set assigned:	DMH1

Source files included

File (3)	Language	Type	Analysis status	Action	Number of lines in file	Source location
DMHSRC06	COB	Included source	Completed	delete, annotate	36	C:\DMH\SAMPLE\SOURCE\DMHSRC06
DMHSRC07	COB	Included source	Completed	delete, annotate	19	C:\DMH\SAMPLE\SOURCE\DMHSRC07
DMHSRC11	COB	Included source	Completed	delete, annotate	28	C:\DMH\SAMPLE\SOURCE\DMHSRC11

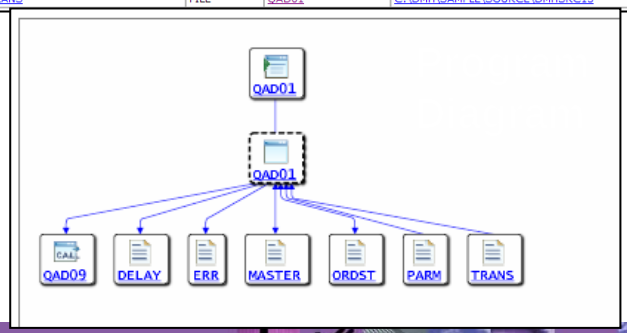
Entry point (1)	Type	Action
QAD01	primary	annotate

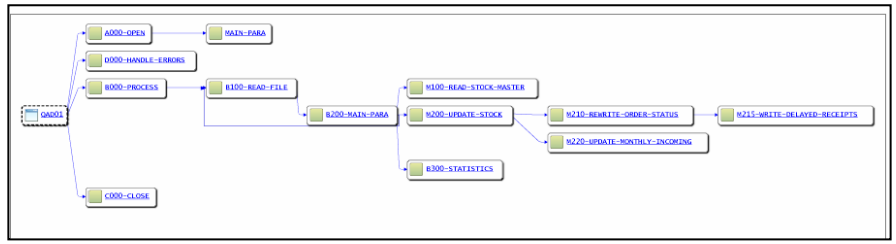
Run units using this program

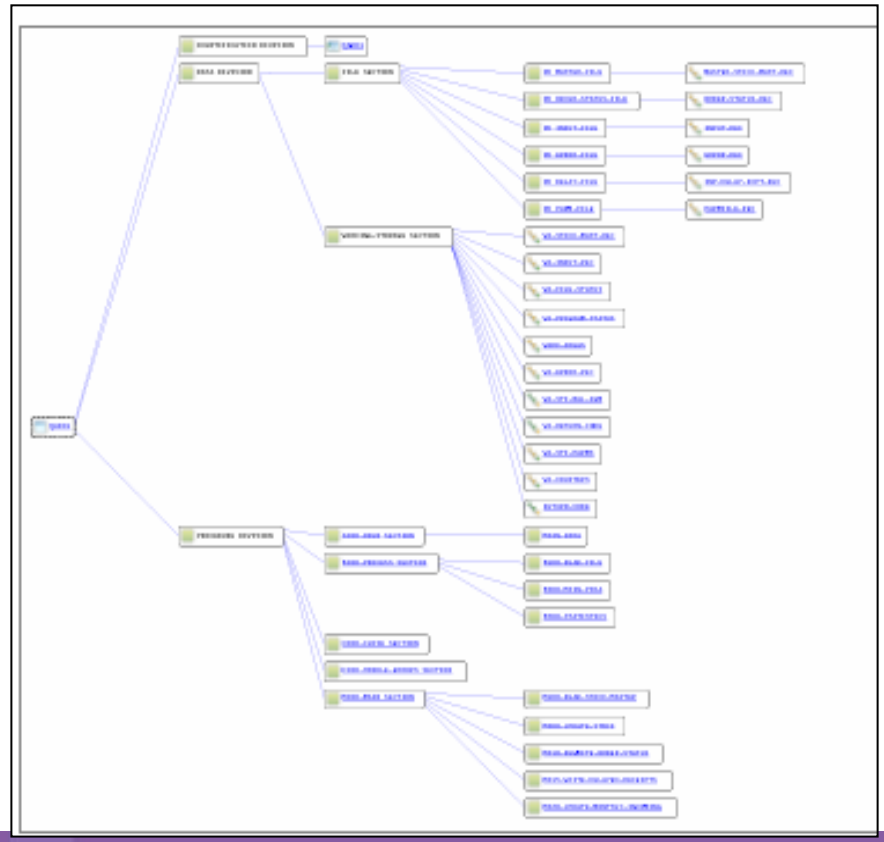
Run unit (1)	Analysis status	References	Action
QAD01	Completed	1	annotate

Control transfer to (1)	Type	Sequence	Parameters
Static (literal): QAD09	CALL	1	WS-STK-PARMS

Data store (6)	Type	Program	Source location
DELAY	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSRC13
ERR	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSRC13
MASTER	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSRC13
ORDST	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSRC13
PARM	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSRC13
TRANS	FILE	QAD01	C:\DMH\SAMPLE\SOURCE\DMHSRC13







EJB Jar Details

Context : Explore distributed assets | EJB JAR summary | EJB JAR details

EJB JAR details

Details

Name:	CustomerJAR
File:	customer-ejb.jar
Description:	
Client JAR:	
EJB-JAR.xml file:	ejb-jar.xml
Manifest file:	MANIFEST
Path:	C:/temp/new/AnalyzersTests/ejblink/customer-ejb.jar
Last changed:	2005-03-14 10:06:14.0
Enterprise app:	
Application servers:	
Server groups:	
Site:	wsaa2
Scan root:	AnalysisTests
Application:	AnalysisTests

Contained EJBs (6)

- AccountEJB
- AddressEJB
- ContactInfoEJB
- CreditCardEJB
- CustomerEJB
- ProfileEJB

Java packages (18)

- com.sun.j2ee.blueprints.address.ejb
- com.sun.j2ee.blueprints.address.ejb.websphere_deploy
- com.sun.j2ee.blueprints.address.ejb.websphere_deploy.CLOUDSCAPE_V50_1
- com.sun.j2ee.blueprints.contactinfo.ejb
- com.sun.j2ee.blueprints.contactinfo.ejb.websphere_deploy
- com.sun.j2ee.blueprints.contactinfo.ejb.websphere_deploy.CLOUDSCAPE_V50_1
- com.sun.j2ee.blueprints.creditcard.ejb
- com.sun.j2ee.blueprints.creditcard.ejb.websphere_deploy
- com.sun.j2ee.blueprints.creditcard.ejb.websphere_deploy.CLOUDSCAPE_V50_1
- com.sun.j2ee.blueprints.customer.account.ejb
- com.sun.j2ee.blueprints.customer.account.ejb.websphere_deploy
- com.sun.j2ee.blueprints.customer.account.ejb.websphere_deploy.CLOUDSCAPE_V50_1
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- com.sun.j2ee.blueprints.customer.ejb.websphere_deploy.CLOUDSCAPE_V50_1
- com.sun.j2ee.blueprints.customer.profile.ejb
- com.sun.j2ee.blueprints.customer.profile.ejb.websphere_deploy
- com.sun.j2ee.blueprints.customer.profile.ejb.websphere_deploy.CLOUDSCAPE_V50_1

EJB relationships (5)

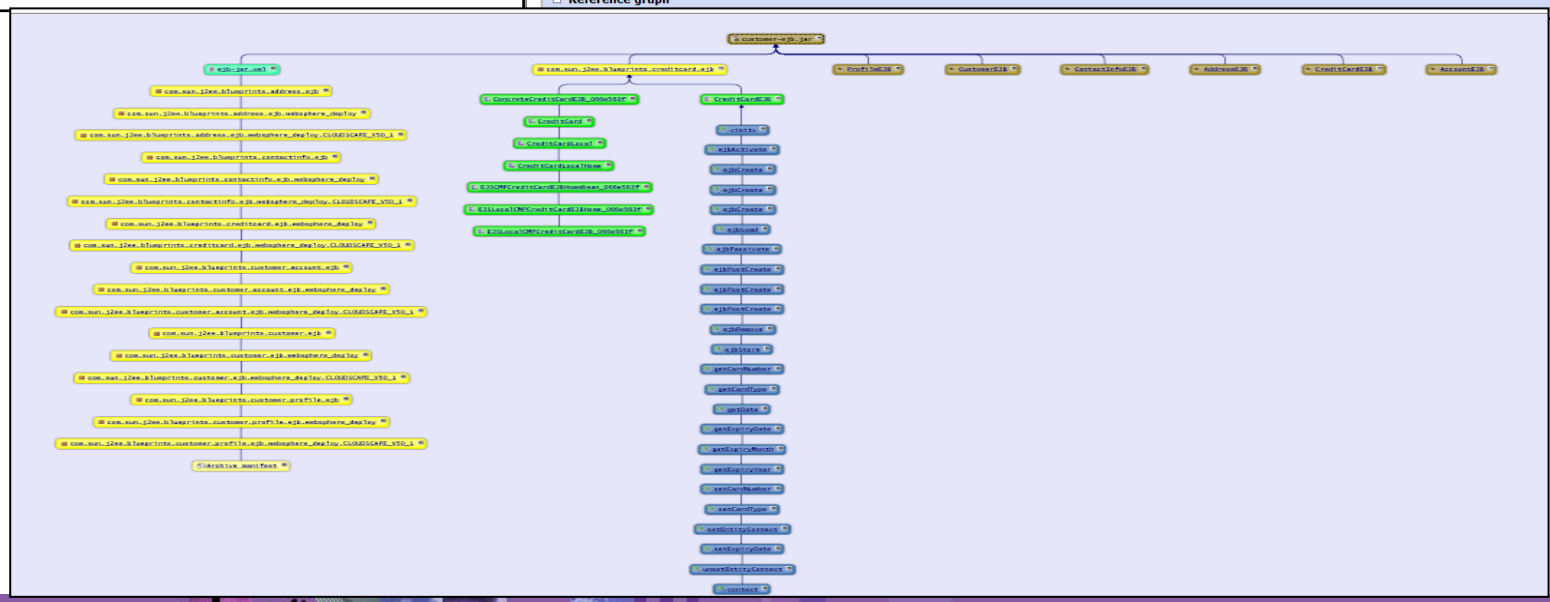
Relationship name	1st role name	1st role multi	1st role EJB	1st role cas del	1st role cmr name	2nd role name	2nd role multi	2nd role EJB	2nd role cas del	2nd role cmr name
	account	One	CustomerEJB	False	account	accountCustomerEJBInverse	One	AccountEJB	True	
	address	One	ContactInfoEJB	False	address	addressContactInfoEJBInverse	One	AddressEJB	True	
	profile	One	CustomerEJB	False	profile	profileCustomerEJBInverse	One	ProfileEJB	True	
	contactInfo	One	AccountEJB	False	contactInfo	contactInfoAccountEJBInverse	One	ContactInfoEJB	True	
	creditCard	One	AccountEJB	False	creditCard	creditCardAccountEJBInverse	One	CreditCardEJB	True	

Annotation text (0)

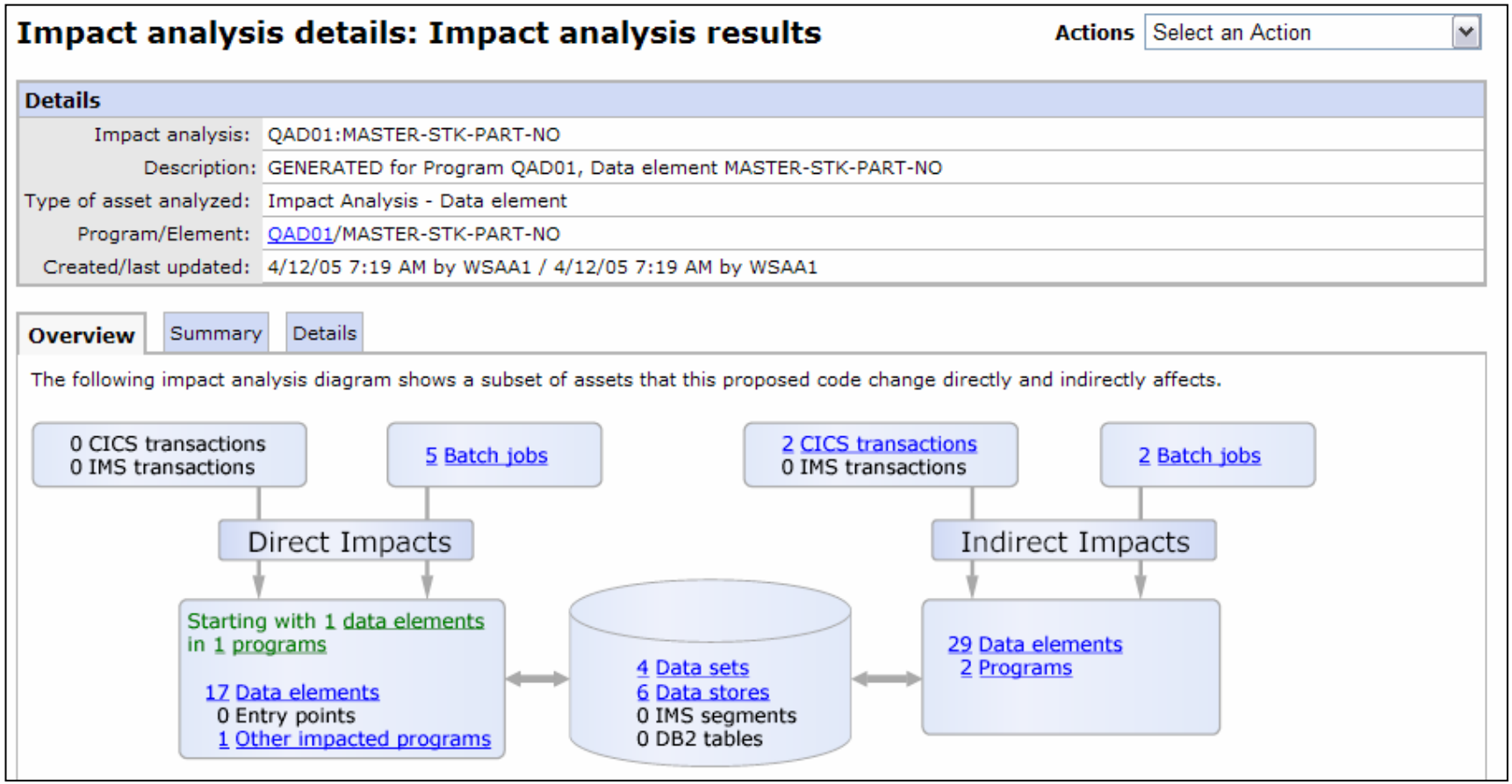
Impact analyses that start with this asset (2)

Impact analyses that show an impact on this asset (2)

Reference graph

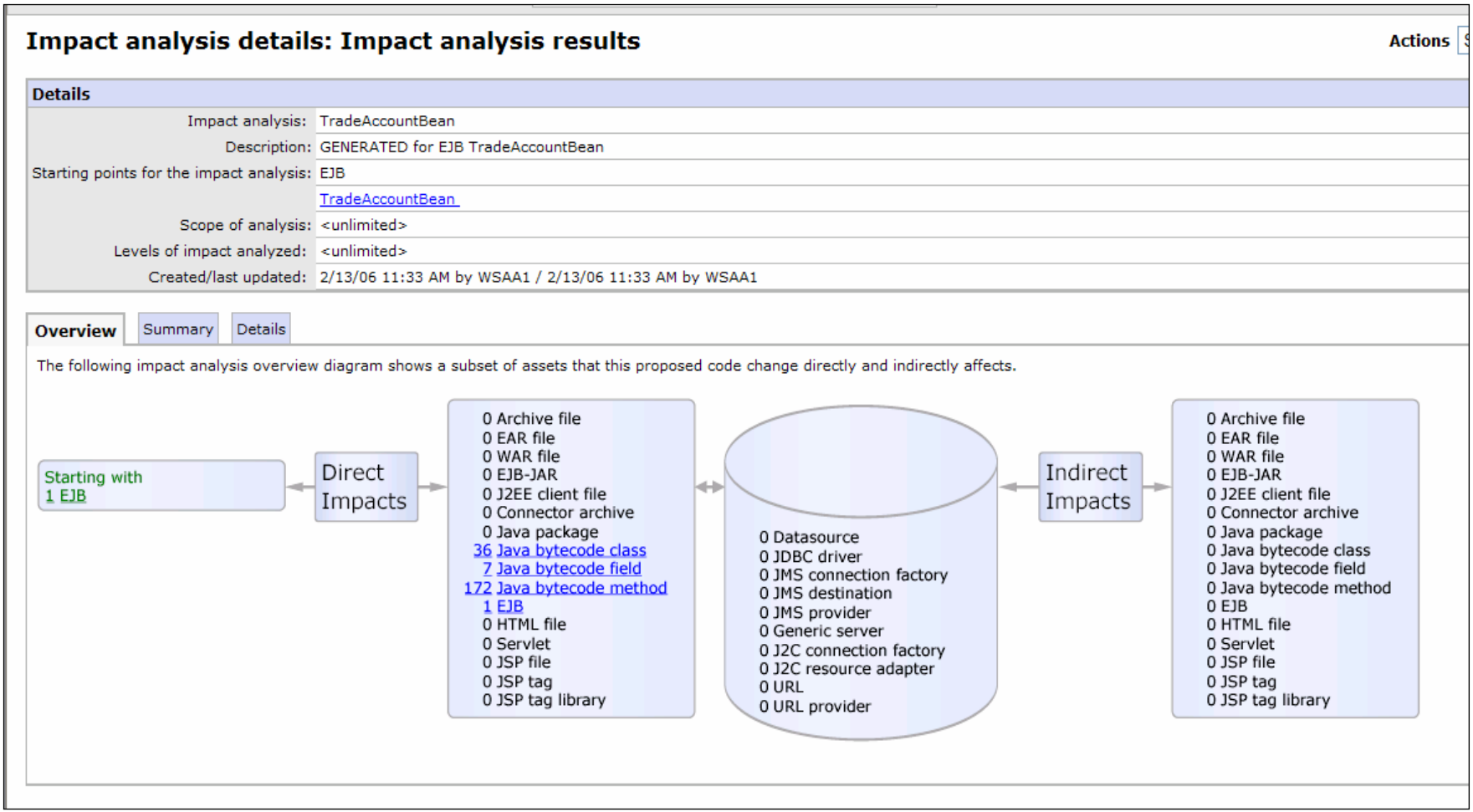


Performing Impact Analysis



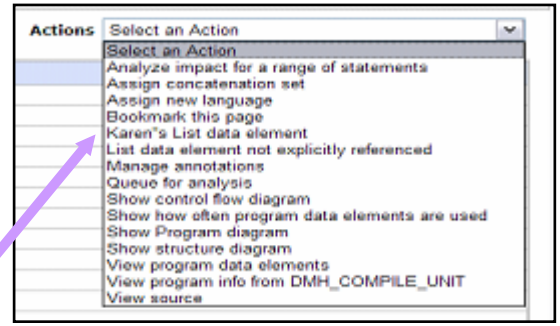
- **WSAA automates the discovery cycle**
  - **30% of development costs is spent in the analysis cycle**
- **WSAA automates the analysis of the impact of a requested change on other systems**

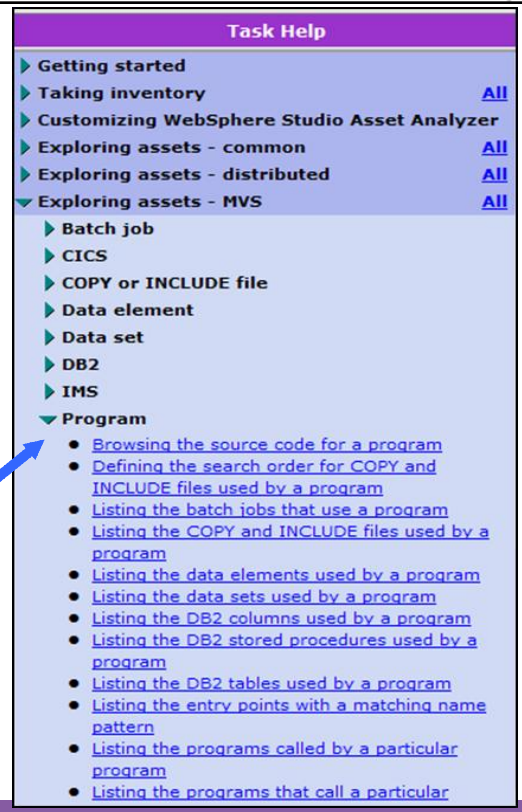
Performing Impact Analysis on distributed assets



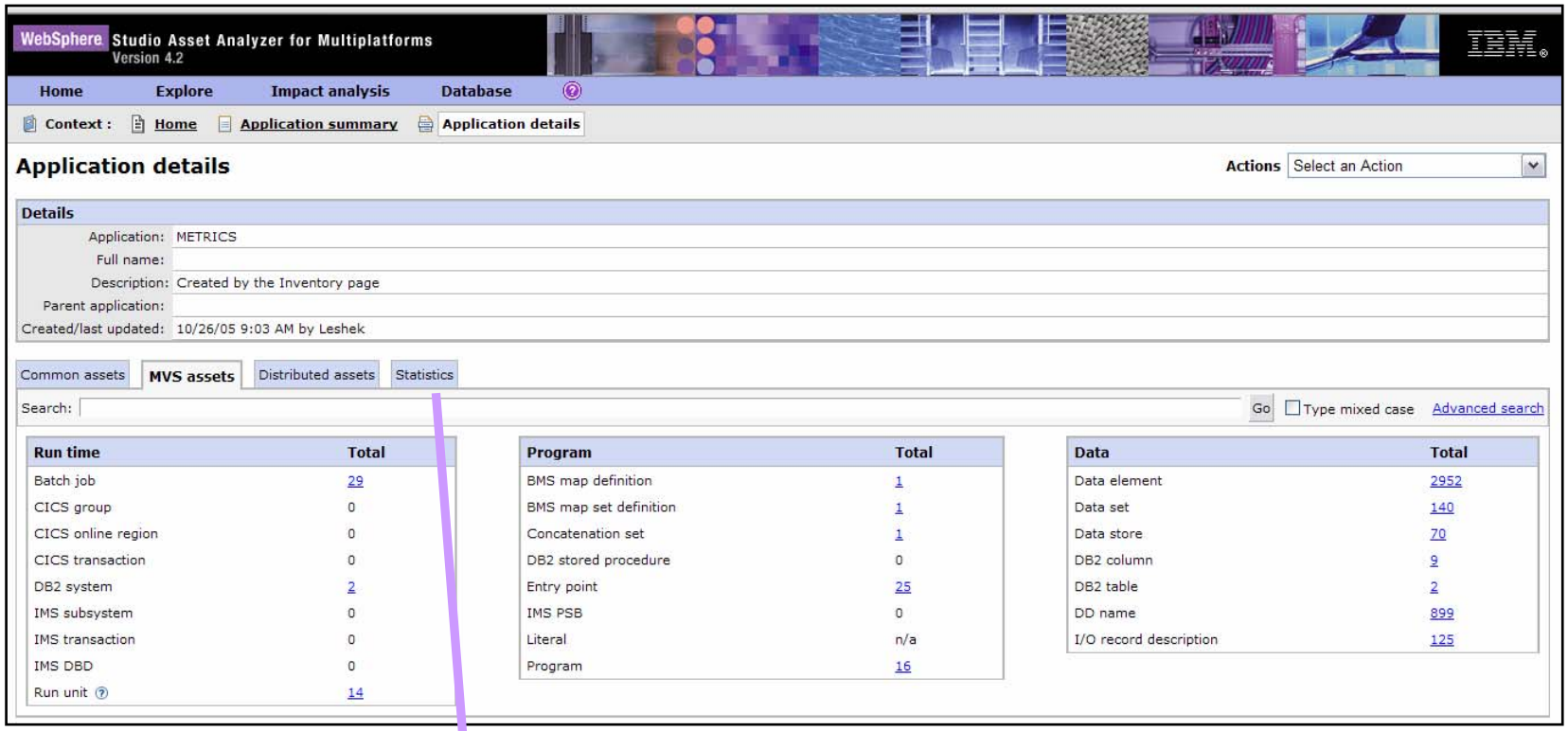
New in WSAA V4.2 – selected highlights

- Complexity metrics for COBOL & PL/I programs
- More application-level reporting
- Impact Analysis scoping by application
  - better scalability (addressed in V4.1 PTF)
  - and more control over IAs system resource consumption
- Custom Queries – can be attached to action menu on most pages
- Improvements in scanning performance
- J2EE / WebSphere assets available through Web Services API
- Task List available from the Home Page
- Preview of composite application dependencies





More application-level reporting – including metrics



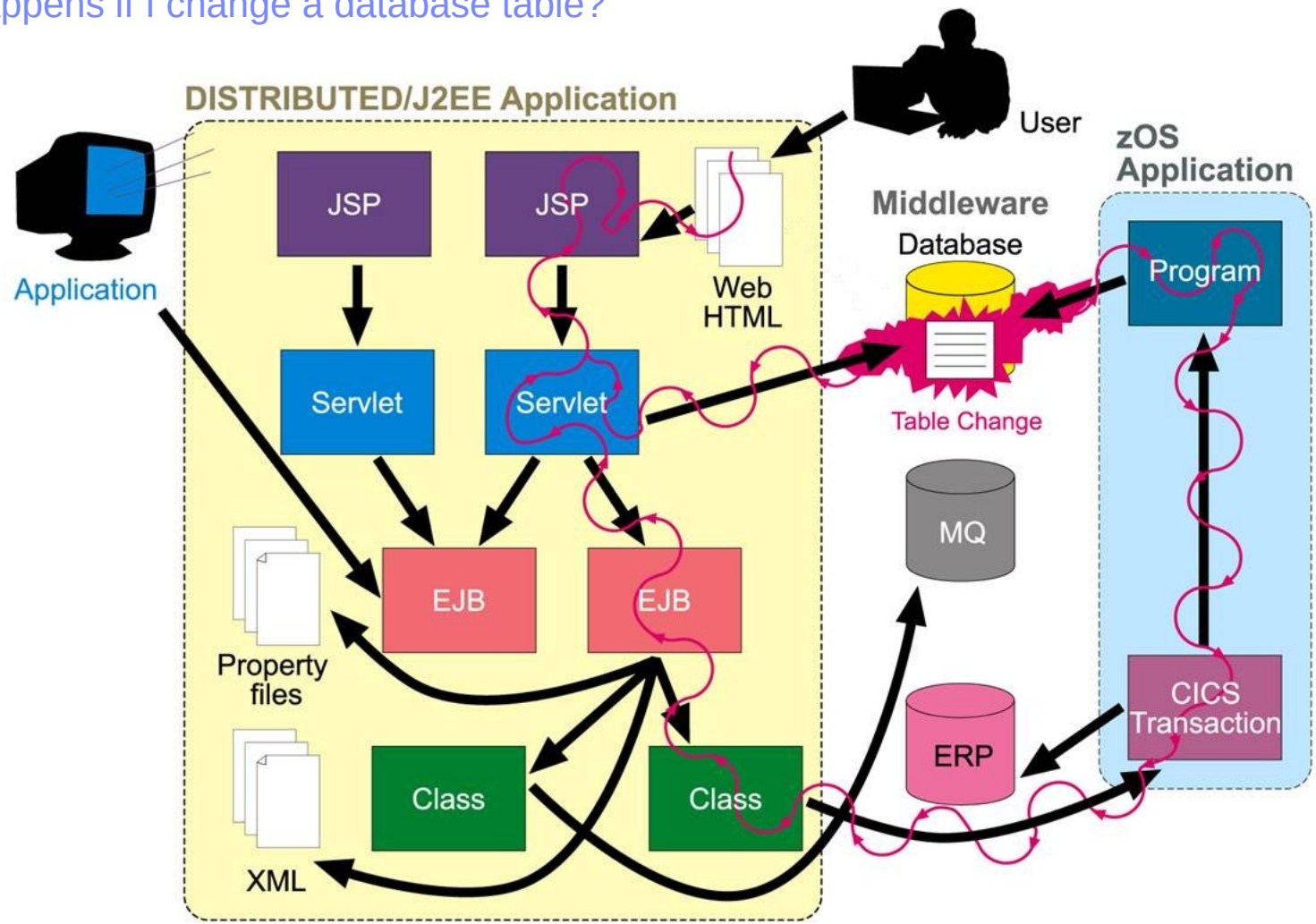
Common assets | MVS assets | Distributed assets | **Statistics**

Attribute (4)	Total	Average
Number of lines in file	13715	187
Halstead Effort	10322587	645161
Essential Complexity	68	4
Cyclomatic Complexity	2747	171

Composite Application Support Preview

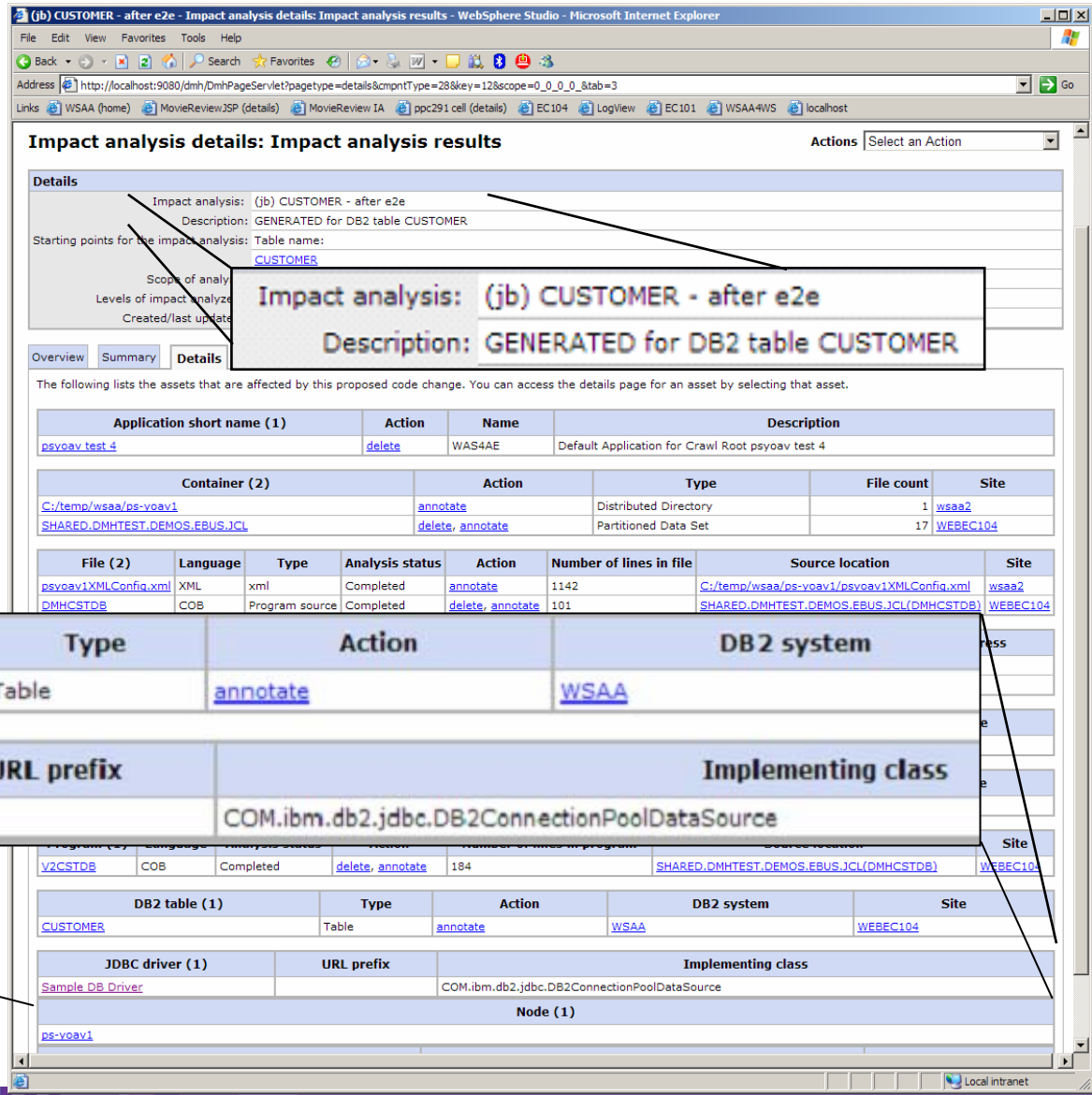
End-to-End Impact Analysis

What happens if I change a database table?



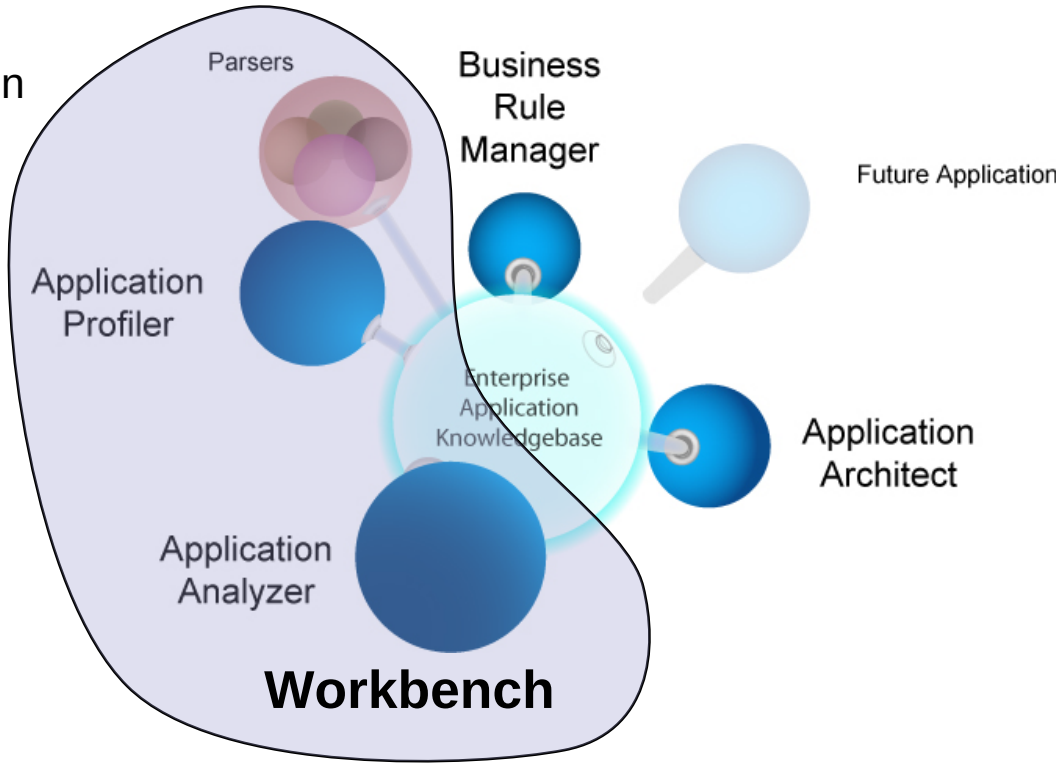
End-to-End Composite Application Impact Analysis

- Impact Analysis results on the database table now include the JDBC driver



Asset Transformation Workbench

- Parsers
  - Source load and inventory reconciliation
- Application Analyzer
  - Deep analysis and reporting functions
- Application Profiler
  - Team access via the web for ATW generated reports
- WSAA Bridge
  - Download support for assets identified by WSAA Impact Analysis projects

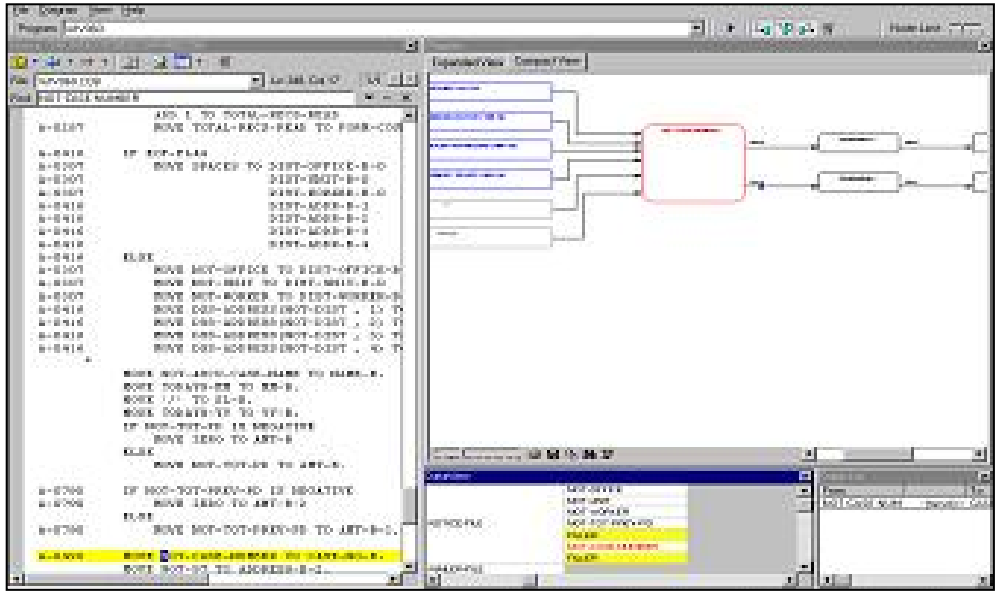


Relativity TECHNOLOGIES

Application Analyzer™

- **Application Project Portfolio Management and Assessments**
  - **Powerful querying tools** deliver deep insight
  - **Inventory reports** give a total snapshot of your portfolio
  - **Complexity analysis** and **estimation** allow managers to understand where to direct resources
  - **Impact analysis** identifies the effect of changes
- **Visual, Interactive documentation and deep insight**
  - **Multiple, interactive views** illustrate programmatic and information flows
  - **Workstation–GUI** implementation ensures rapid response to user requests
  - Users have access to the most **current information** about your application portfolio

Global Data Flow Analysis



- **Team-centric and customizable**
  - Reports and diagrams can easily be **shared**
  - **Application visualization** is highly customizable
  - **Analysis tools** can be tailored to suit requirements
  - **Executive-Level reports** provide managers with dashboard view

Application Profiler™

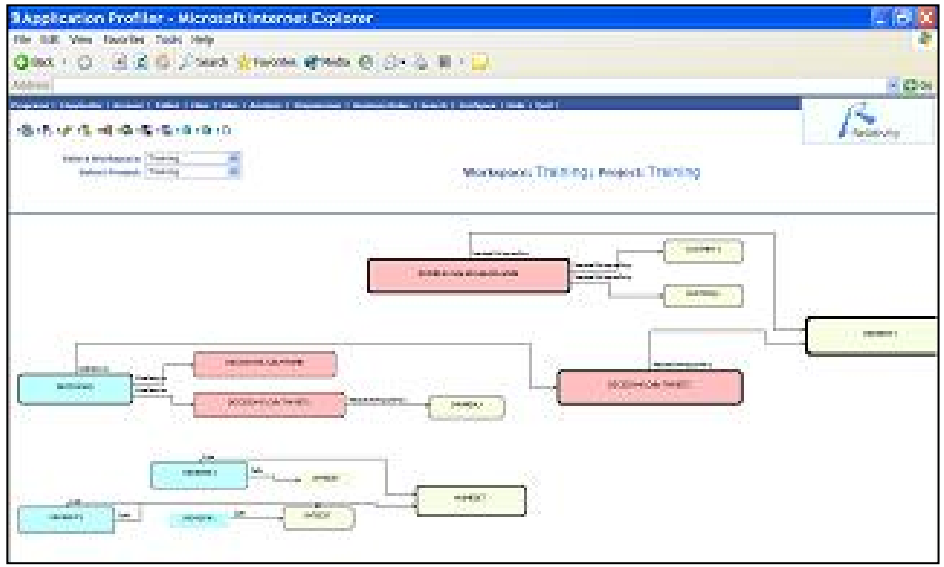
Accessibility and usability

- Information **bottlenecks are removed**
- **No additional software** simplifies management
- **Intuitive interface** accelerates user productivity
- **Dynamic access** delivers up-to-date information

Efficient application portfolio assessments

- System documentation is **easy to retrieve**
- Powerful diagrams illustrate **inter- and intra-program** relationships
- **Interactive and synchronized views** allow for efficient portfolio assessments

Call map diagrammer

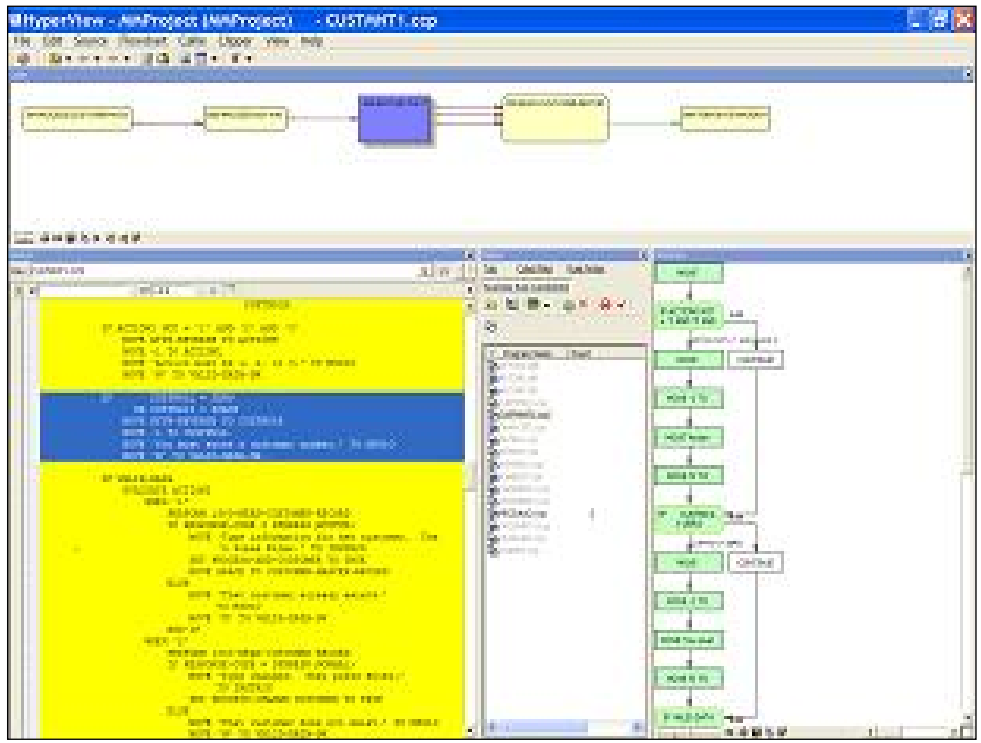


Streamlined application management

- Analysts can **audit and control** business logic
- Managers gain a complete **overview** of their systems
- Complexity analysis helps to **focus resources**
- **Impact analysis** allows analysts to control the effect of changes to applications

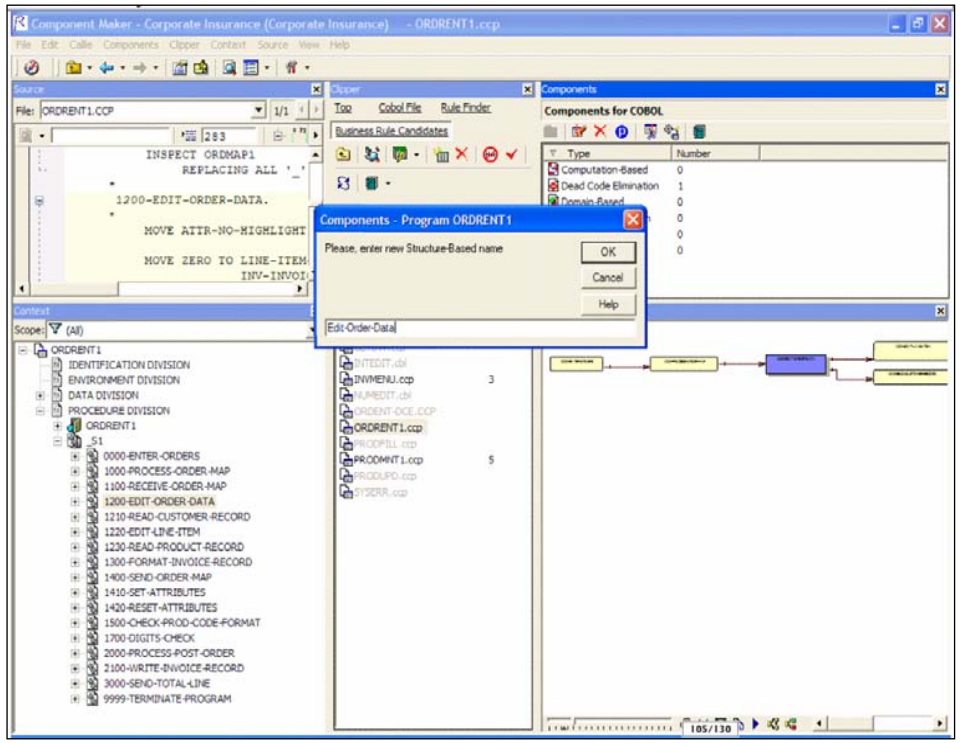
Business Rule Manager™ extension:
Accelerated business rule identification and management

- Sophisticated search tools
  - help to **quickly identify rules**
- Powerful interrogation tools
  - **simplify manual searches**
- Create rules directly from a search screen
  - **accelerates the collection process**
- 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
- Customizable interface
  - allows analysts to **efficiently manage** their business rules portfolio



Application Architect™ extension

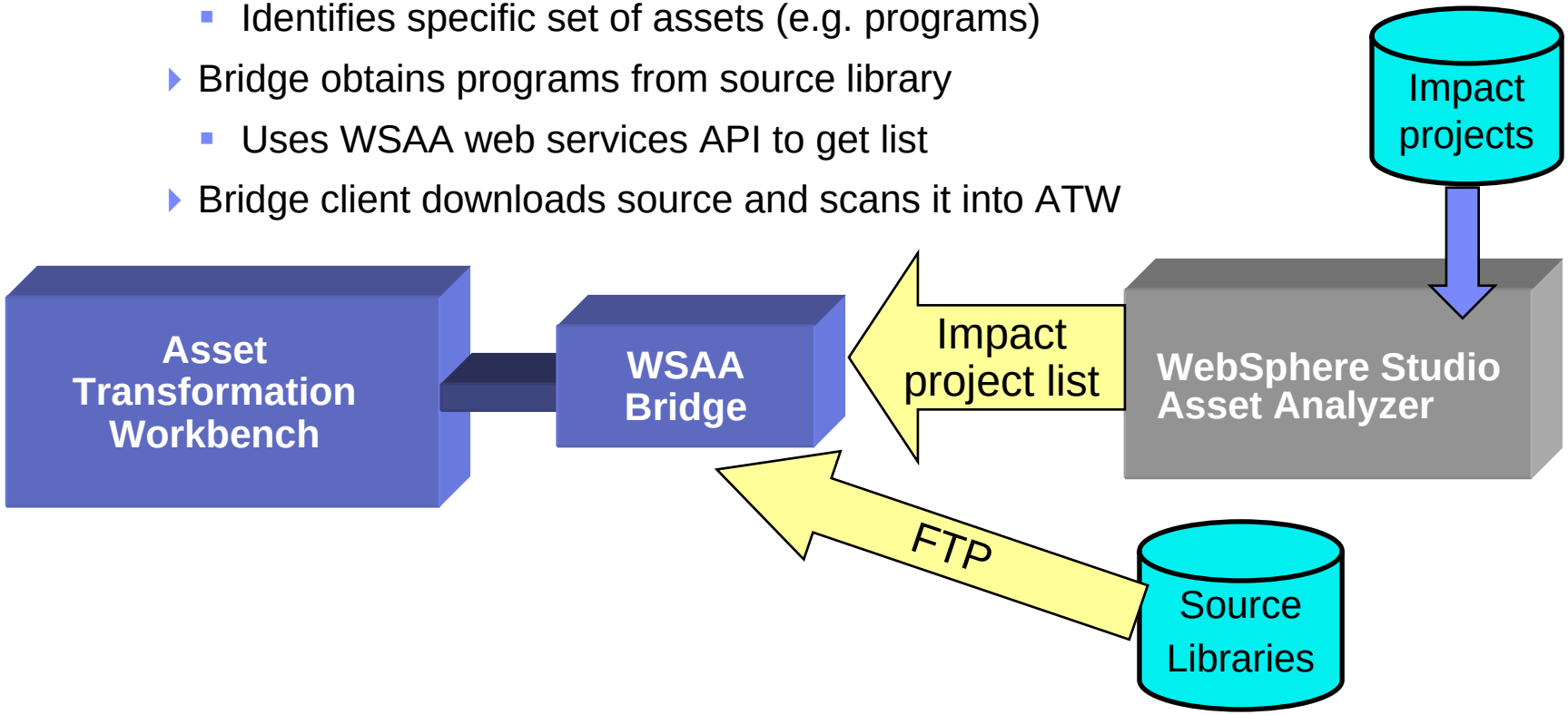
- **More efficient operations through componentization**
  - Multiple componentization tools enable the creation of **more reusable and maintainable** programs
  - Examines all dependencies to ensure that the extraction is a **functionally complete** component
  - Coverage Report identifies additional 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

WSAA Bridge

- Packaged with the Workbench
  - Client and server components
- Downloads application source to ATW workstation
  - User selects a WSAA Impact Analysis project
    - Identifies specific set of assets (e.g. programs)
  - Bridge obtains programs from source library
    - Uses WSAA web services API to get list
  - Bridge client downloads source and scans it into ATW



Two tools – how can they help with SOA projects and everyday maintenance and development

For migration to SOA projects:

- Use WebSphere Studio Asset Analyzer
  - For enterprise wide understanding of existing mainframe and distributed applications
  - End to end impact analysis of composite applications
  - Understand the complexity of mainframe applications
  - Identify candidates for SOA projects
- Use ATW
  - Project based work
  - Componentize application code for web service

Additional benefits

- Significantly reduce maintenance costs,
- Reduce outages resulting from incomplete analysis prior to making changes made to your existing applications
- Document your applications so developers can quickly become familiar with them and their interrelationships with other systems
- Give your line-of-business executives realistic and achievable project estimates

WSAA & ATW – some usage scenarios

Usage Scenarios	WSAA	ATW
Work with z/OS Assets		
Cobol , PL/I, JCL	Y	Y
CICS, IMS, DB2	Y	Y
Natural		Y
Work with Distributed Assets		
Java, J2EE, WebSphere	Y	
XML, C/C++	Y	
Understand Application		
New developer	Y	Y
Outsourced AD or operations	Y	Y
New system/project	Y	Y
Compliance documentation	Y	Y
Find and manage business rules		Y

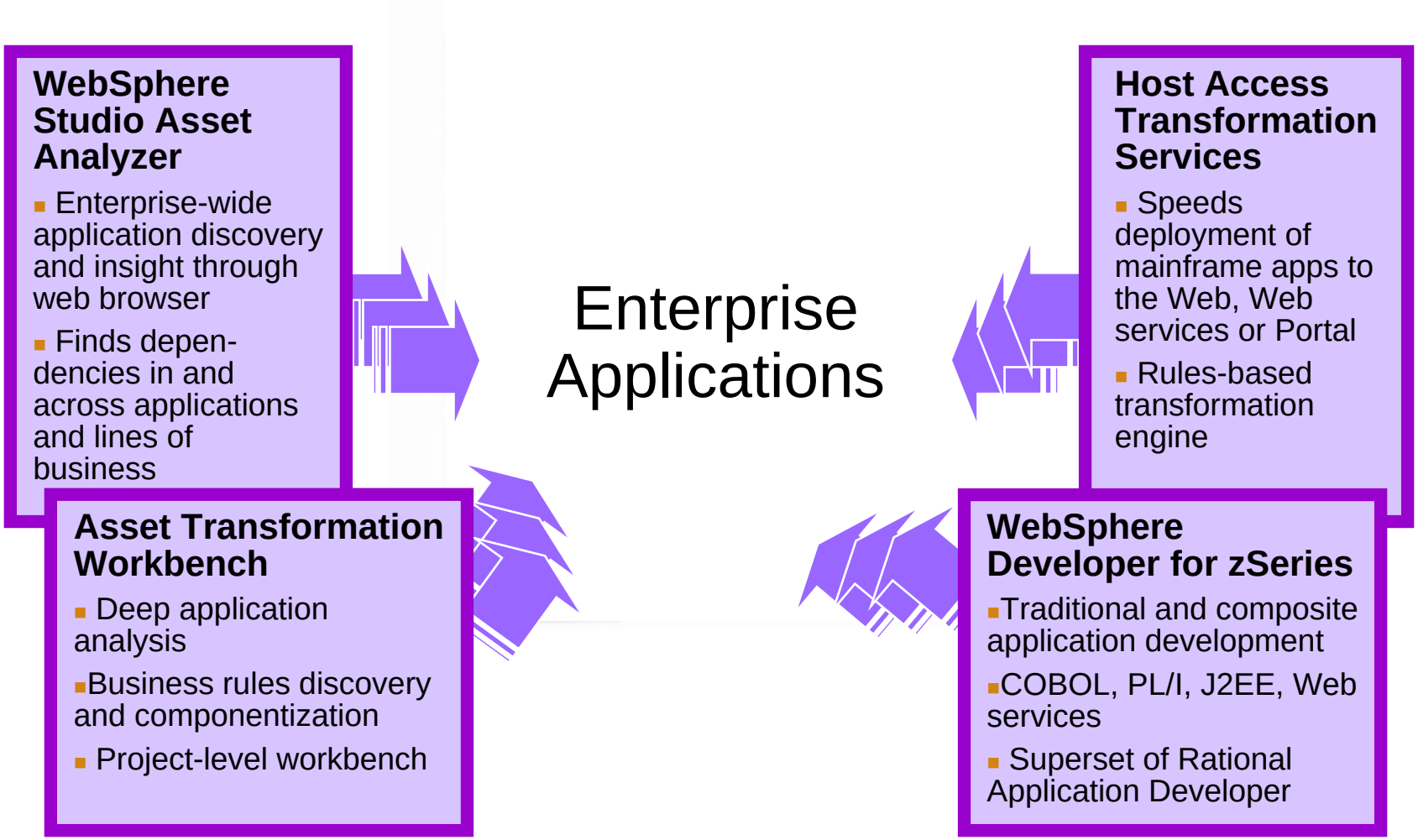
WSAA & ATW – some usage scenarios *(continued)*

Usage Scenarios	WSAA	ATW
Reduce Risk due to Changes		
Identify downstream impact	Y	Y
Project-level	Y	Y
Enterprise-wide	Y	
Composite Applications	Preview in V4.2	
Transform Application Improve Code Maintenance Reduce Complexity		
Refactor/restructure code		Y
Remove dead code		Y
Code slicing		Y
Make more accurate project estimates	Y	Y

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

Usage Scenarios	WSAA	ATW
Deployment		
Use anywhere from browser	Y	Reports & business rules
Run on z/OS	Y	
Scan distributed apps on AIX and Windows	Y	
Scan source where it lives	Y	
Scan CICS, IMS, WebSphere runtime configurations and DB2 Catalog	Y	
Run on workstation		Y

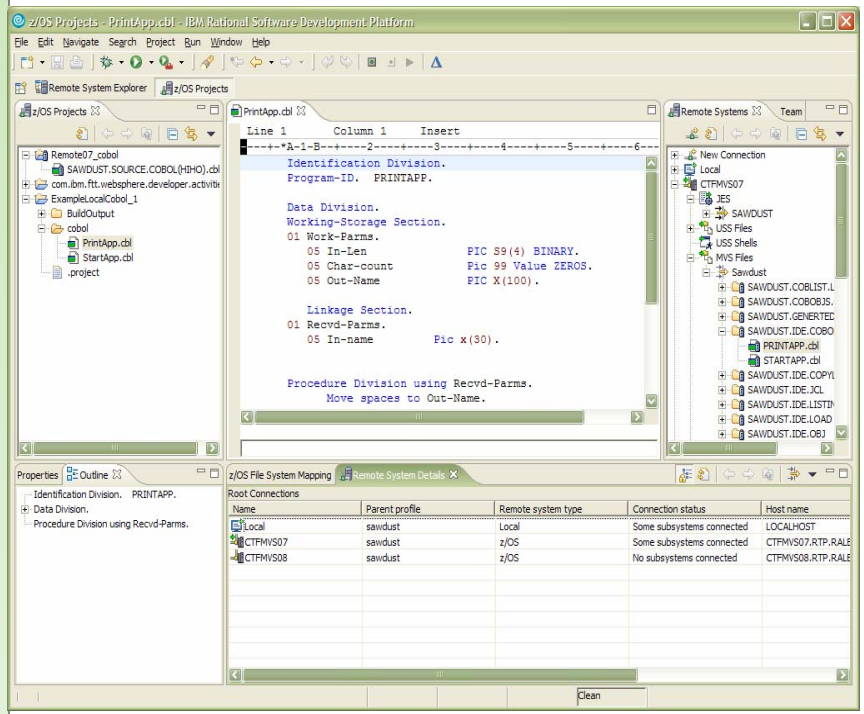
zSeries AD Transformation Tools



WebSphere Developer for zSeries

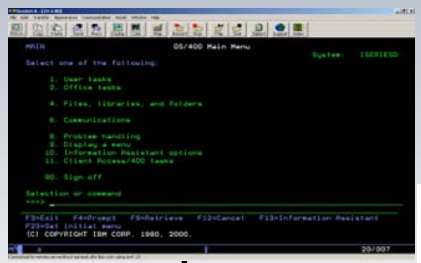
Eclipse-based integrated development environment for developing enterprise-level, multi-tier applications (composite applications)

- **Builds core stack zOS applications**
  - COBOL, PLI, HLASM
  - TSO/Batch, CICS, IMS, DB2
  - DB2 Stored Procedures – COBOL, PLI, Java, SQL
- **Creates COBOL/CICS/JSF/Java/J2EE Multi-tier apps**
  - Built on Rational Application Developer
    - Includes all of the J2EE web development tools
  - Generate JSF/EGL/J2EE web front ends
  - COBOL backends running on zSeries
- **Enables CICS and IMS applications for Web services and SOA**
  - Provides tooling to make it easy to integrate existing applications into an SOA
- **Supports the full application lifecycle**
  - Model, Architect, Develop, Test, Deploy, and Manage



WebSphere Host Access Transformation Services (HATS)

- A Web-to-Host HTML “Emulator”
  - Zero-footprint, zero-download
  - Only software needed on the client is a Web browser
  - Non-invasive, no changes to legacy code



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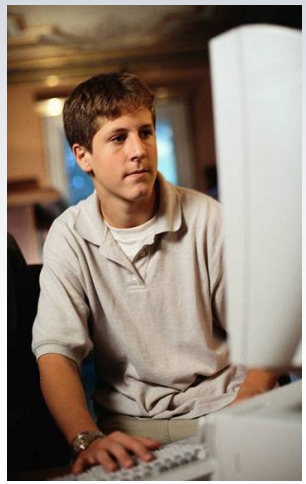
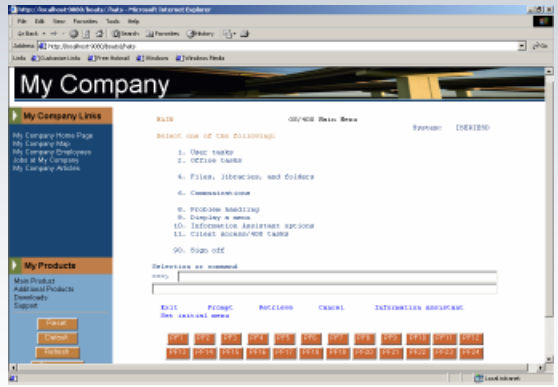
Screen transformation rules running on WebSphere Application Server or WebSphere Portal Server

Web Browser



Pure HTML



Some Current Development Challenges

▪ Developer experience ▸ Less experienced programmers need to be productive "above their experience level"	**WSAA, WDz**
▪ Pressure to do more with less - work faster, better	**All**

▪ Need to align existing apps with current business strategy
  ▸ Moving to composite applications
  ▸ Reusing mainframe programs with web apps and web services
	All

▸ Many apps are not structured in a way that makes this simple to do	**ATW**
▪ Application complexity; large number of developer tools	**WDz**

Additional Information

- websites: www-3.ibm.com/software/awdtools/wsaa/ and www.ibm.com/software/awdtools/atw
  - ✓Demos
  - ✓Announcement letters
  - ✓Documentation
  - ✓Redbook
- Developerworks: www.ibm.com/developerworks
  - Insight and outlook, part 1: Why and when should you choose SOA?
    - http://ibm.com/developerworks/library/ar-itio1/
  - Facing the challenges of Enterprise Transformation
    - http://ibm.com/developerworks/rational/library/4346.html
  - Develop a migration strategy from a legacy enterprise IT infrastructure to an SOA-based enterprise architecture
    - http://ibm.com/developerworks/webservices/library/ws-migrate2soa/

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