

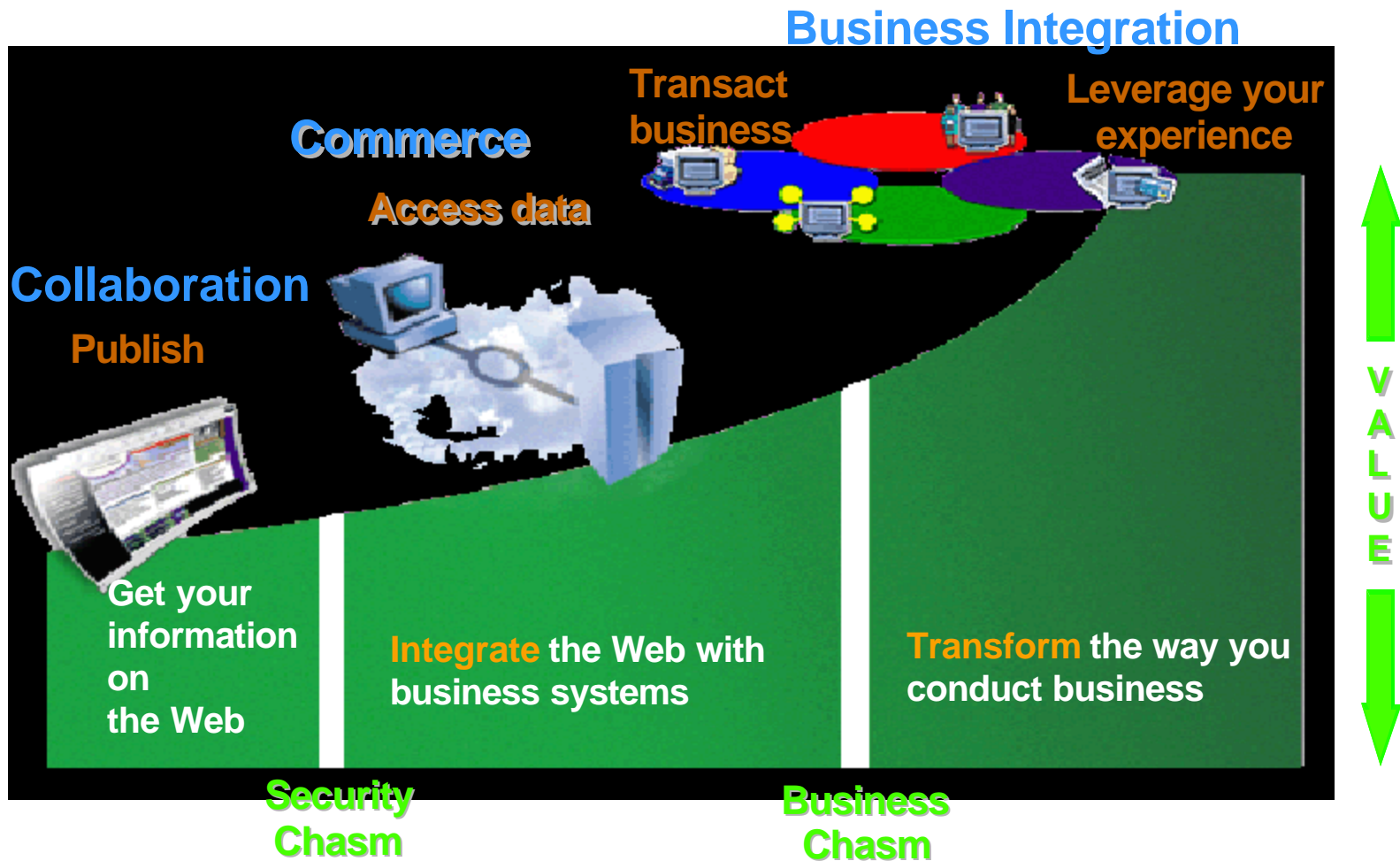
Rapidly Build Java Systems for VSE and VM with IBM VisualAge Generator

Pete Williams
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Agenda

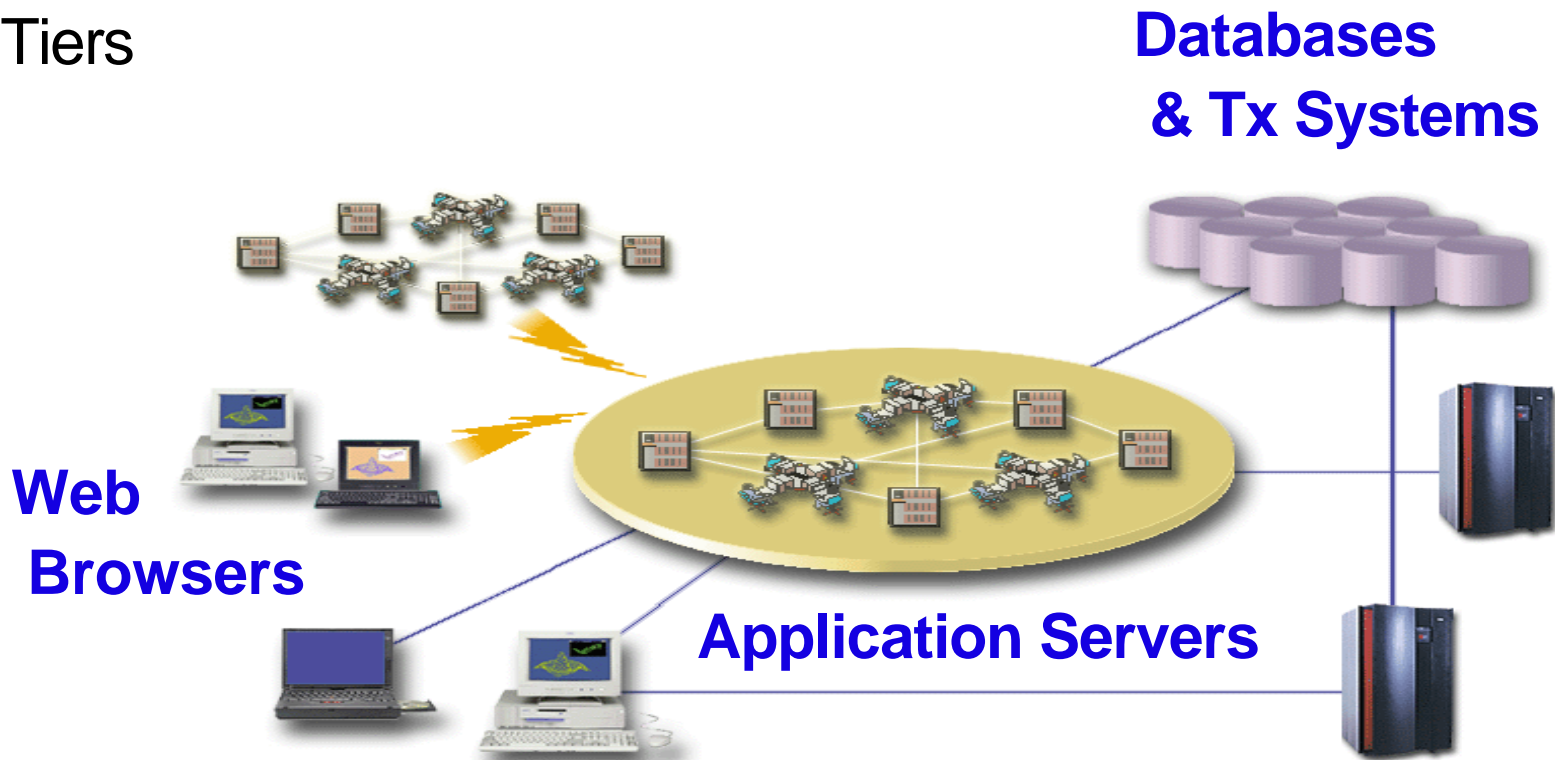
- Challenge of e-business application development
- VisualAge Generator as e-business development Solution
- e-Business RAD demonstration
- More of the VisualAge Generator solution
- Packaging and services
- Summary

Evolution of e-business

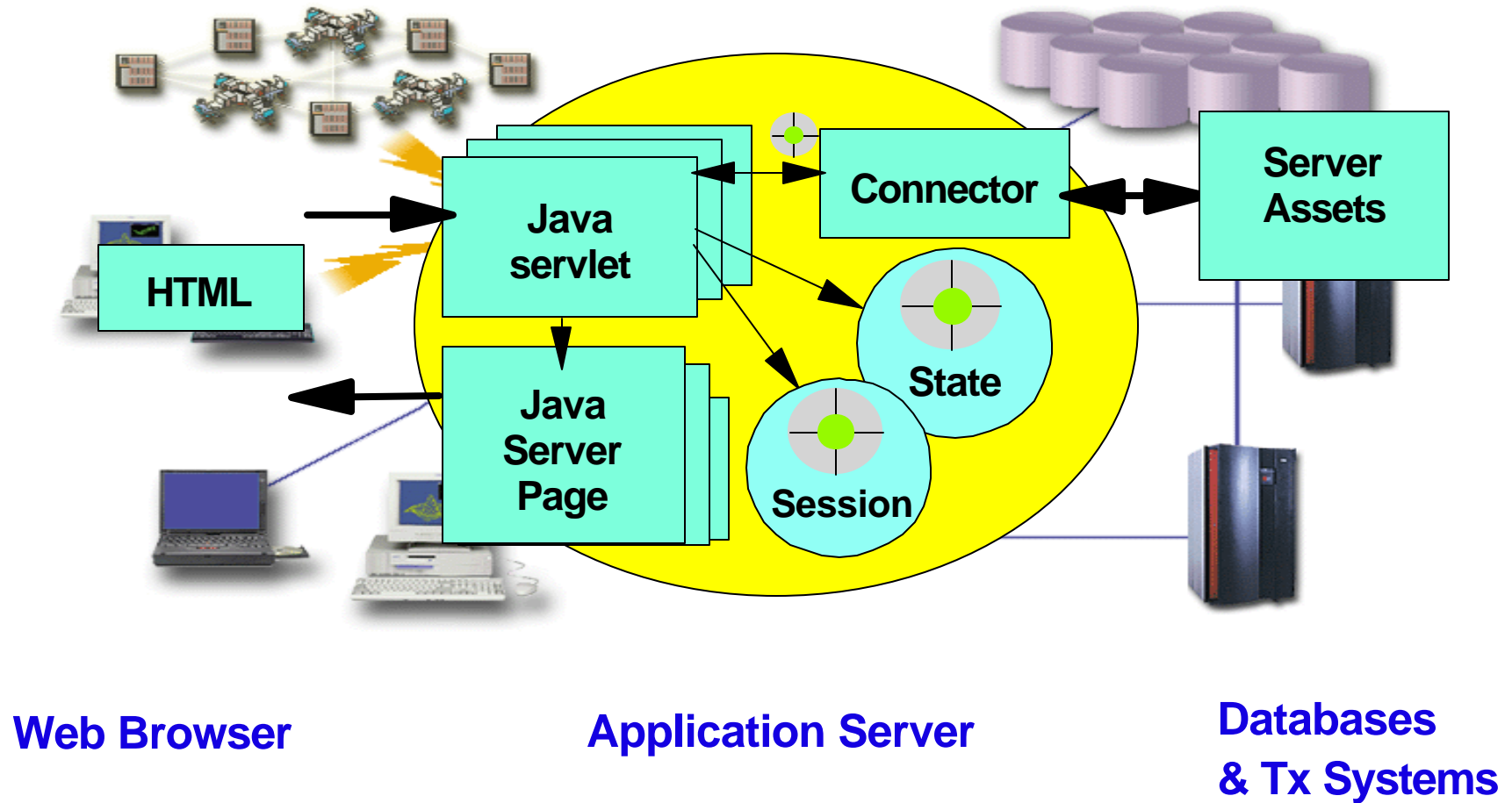


e-Business Topology

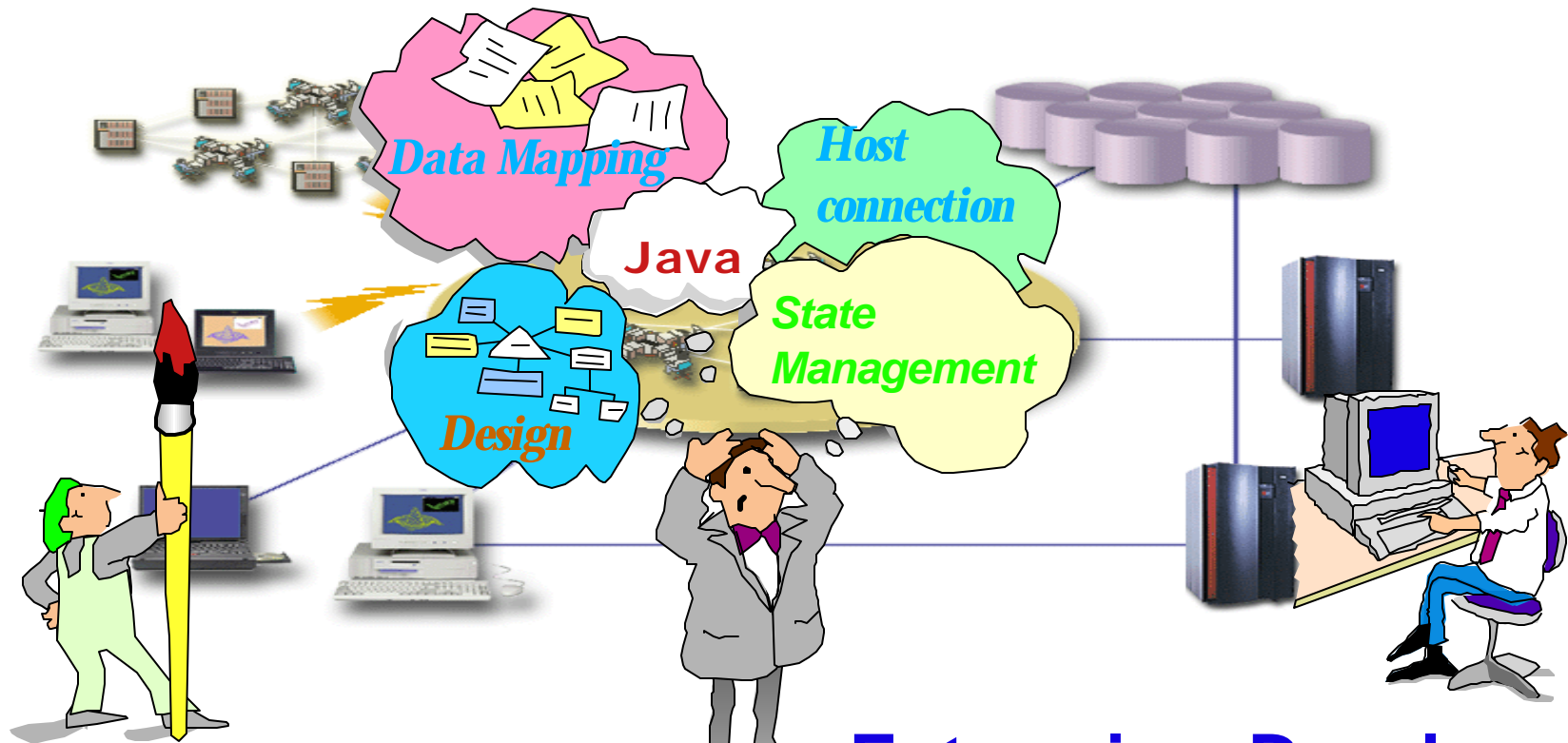
- Dynamic presentation
- Server driven content
- 3 Tiers



e-Business Application Architecture



Who are the AD Players?



Web Developer

- ◆ Organize web site
- ◆ Design UI

Enterprise Developer

- ◆ Business knowledge
- ◆ Multi-user systems design

Application Development Challenges

- How can I leverage my staff's current **skills** while moving to a distributed, web enabled world?
- How can **new staff** build apps for mainframe and TP monitors?
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- Can I build modern systems that **integrate my existing** applications, data and transactions?
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- How can I deliver my systems in **record time**?

IDC says...

"VisualAge Generator V4: Setting the Standard for 4GLs in eBusiness Solutions"

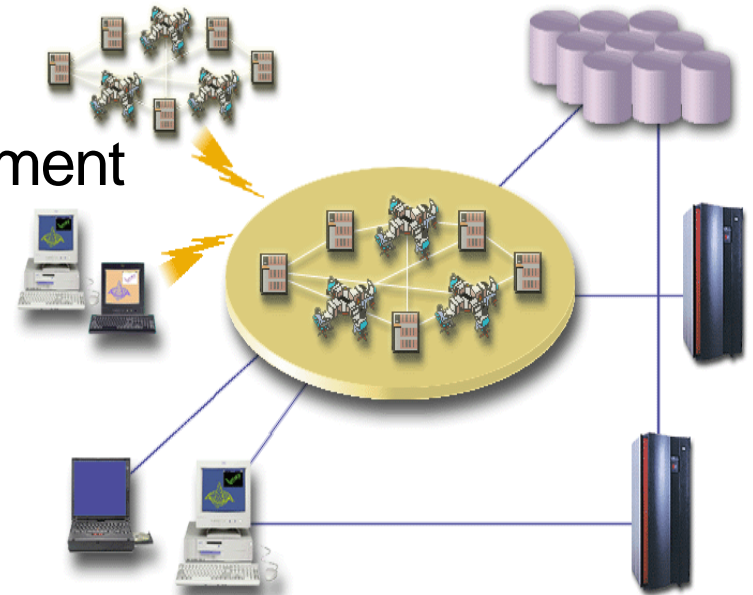
"As IBM's enterprise customers restructure for 21st-century e-business, software solutions such as VisualAge Generator make enterprise development more productive"

IDC Bulletin #18221 Dec 1999



The VisualAge Generator Solution

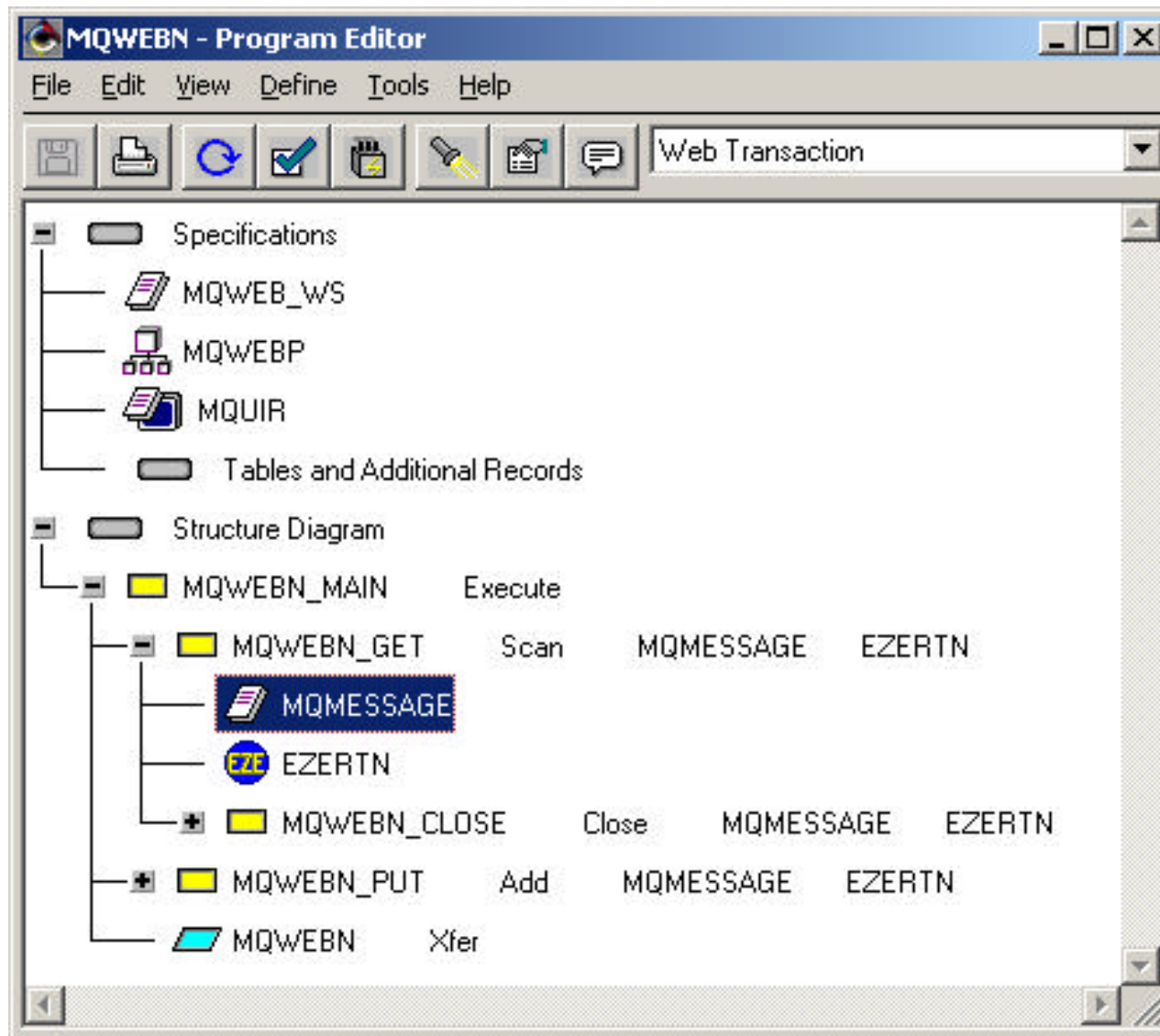
- Enable rapid application development by shielding the enterprise developer from the complexities of the implementation technology
 - ▶ High level specification and construction
 - ▶ Iterative development and test
 - ▶ Automated generation for target environment
- Benefits:
 - ▶ Leverage existing skills
 - ▶ Rapidly develop e-business applications
 - ▶ Provide *PC - Mainframe* scaleability



High Level Specification and Construction

- Easy and quick to learn
 - ▶ Shields developer from underlying complexities
 - ▶ Language and construction similar to traditional development
- Program definition
 - ▶ consistent construction
 - ▶ differentiated by program type
 - ▶ Web Transaction, Called Batch, etc.
- I/O options
 - ▶ web browser access
 - ▶ CONVERSE customer_page
 - ▶ data access
 - ▶ INQUIRY customer_table

High Level Specifications - Program Definition

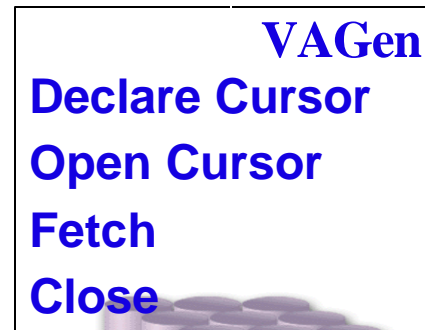


High-level specifications - I/O options

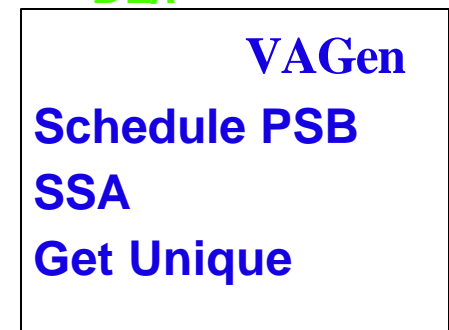
CONVERSE CUSTOMER_PAGE
WebSphere



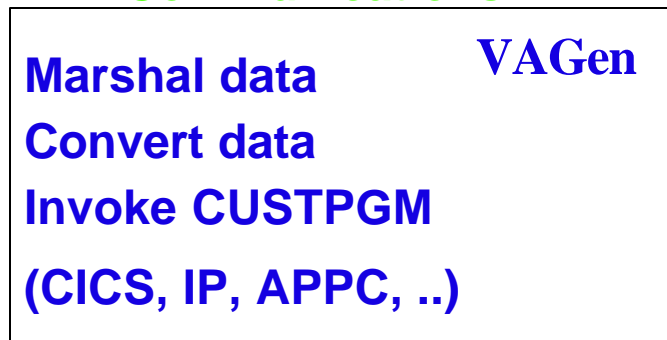
INQUIRY CUSTOMER_TABLE
SQL



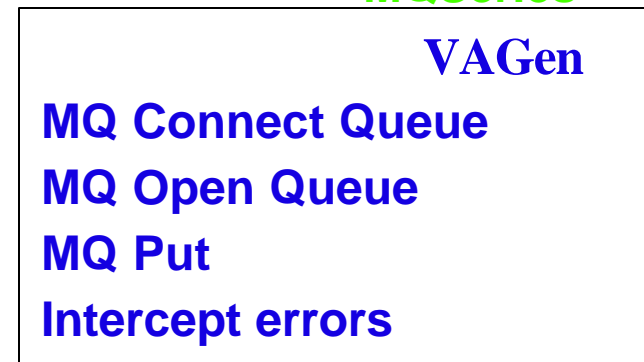
DL/I



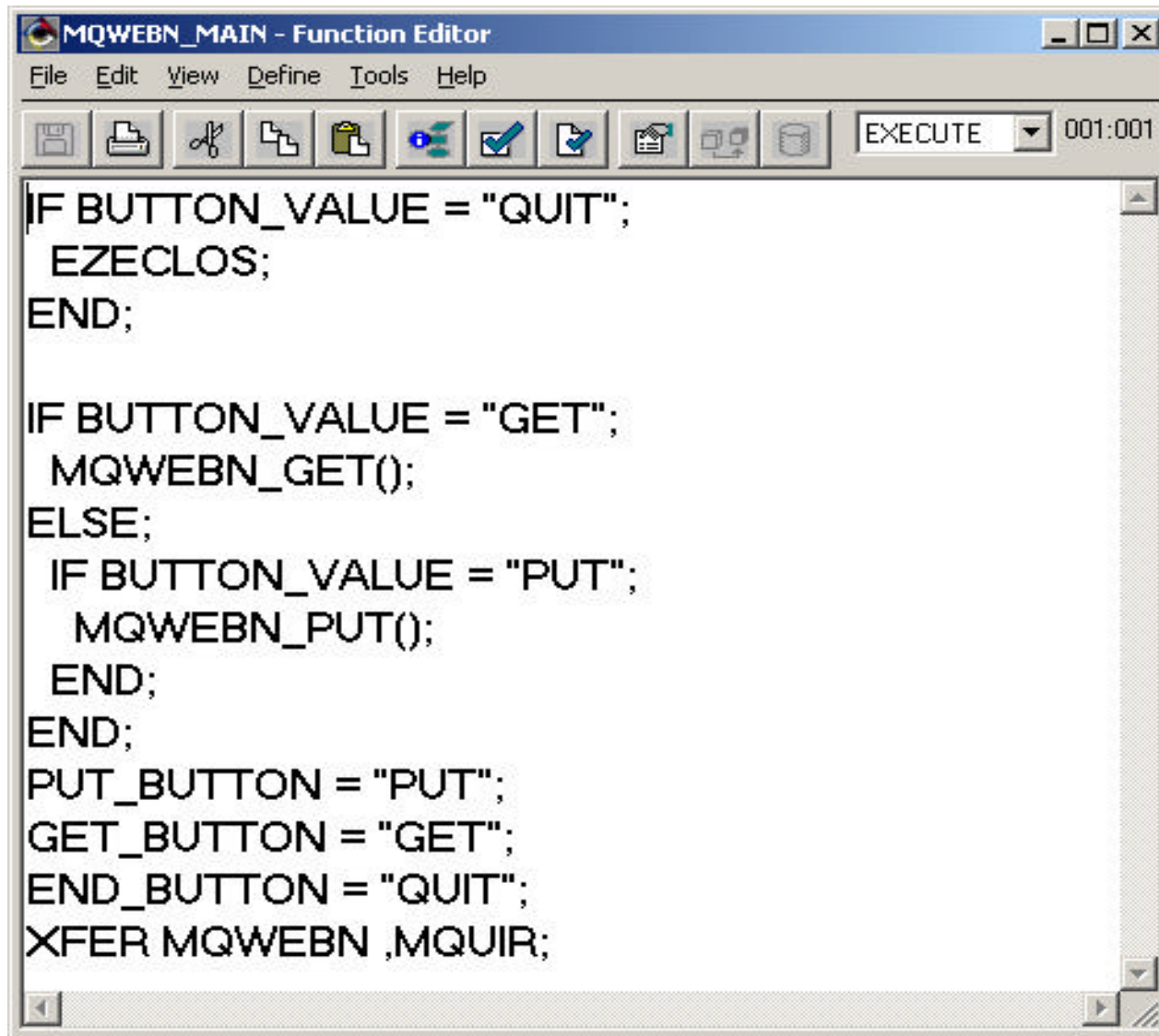
CALL CUSTPGM DATA
Communications



ADD CUSTINFO
MQSeries



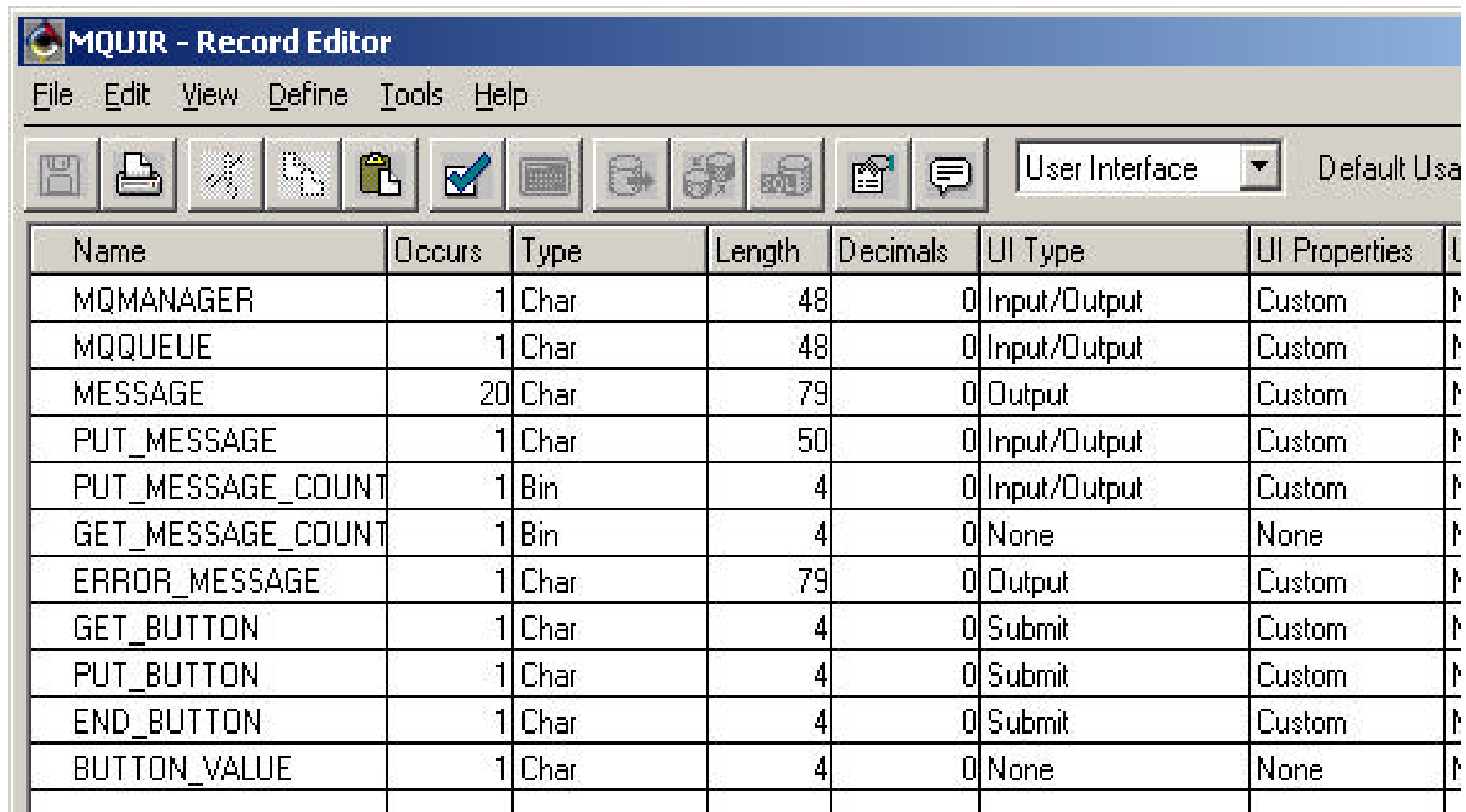
Sample Code - Displaying a browser page



The image shows a screenshot of a software application window titled "MQWEBN_MAIN - Function Editor". The window has a menu bar with "File", "Edit", "View", "Define", "Tools", and "Help". Below the menu bar is a toolbar with various icons for file operations (save, print, copy, paste, delete) and a "EXECUTE" button. The main area of the window contains the following code:

```
IF BUTTON_VALUE = "QUIT";  
  EZECLOS;  
END;  
  
IF BUTTON_VALUE = "GET";  
  MQWEBN_GET();  
ELSE;  
  IF BUTTON_VALUE = "PUT";  
    MQWEBN_PUT();  
  END;  
END;  
PUT_BUTTON = "PUT";  
GET_BUTTON = "GET";  
END_BUTTON = "QUIT";  
XFER MQWEBN ,MQUIR;
```

Sample code - Displaying a browser page

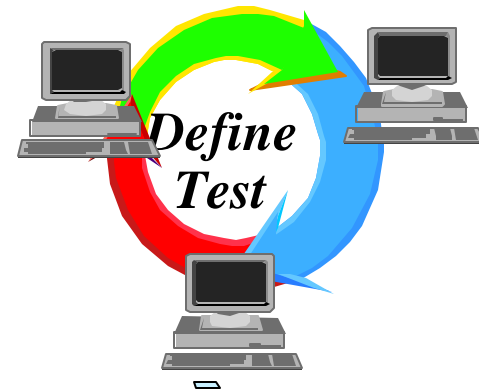


The screenshot shows the 'MQDIR - Record Editor' application window. The title bar is blue with the text 'MQDIR - Record Editor'. Below the title bar is a menu bar with 'File', 'Edit', 'View', 'Define', 'Tools', and 'Help'. A toolbar contains various icons for file operations and editing. A dropdown menu is set to 'User Interface' and 'Default Usa' is visible on the right. The main area contains a table with the following data:

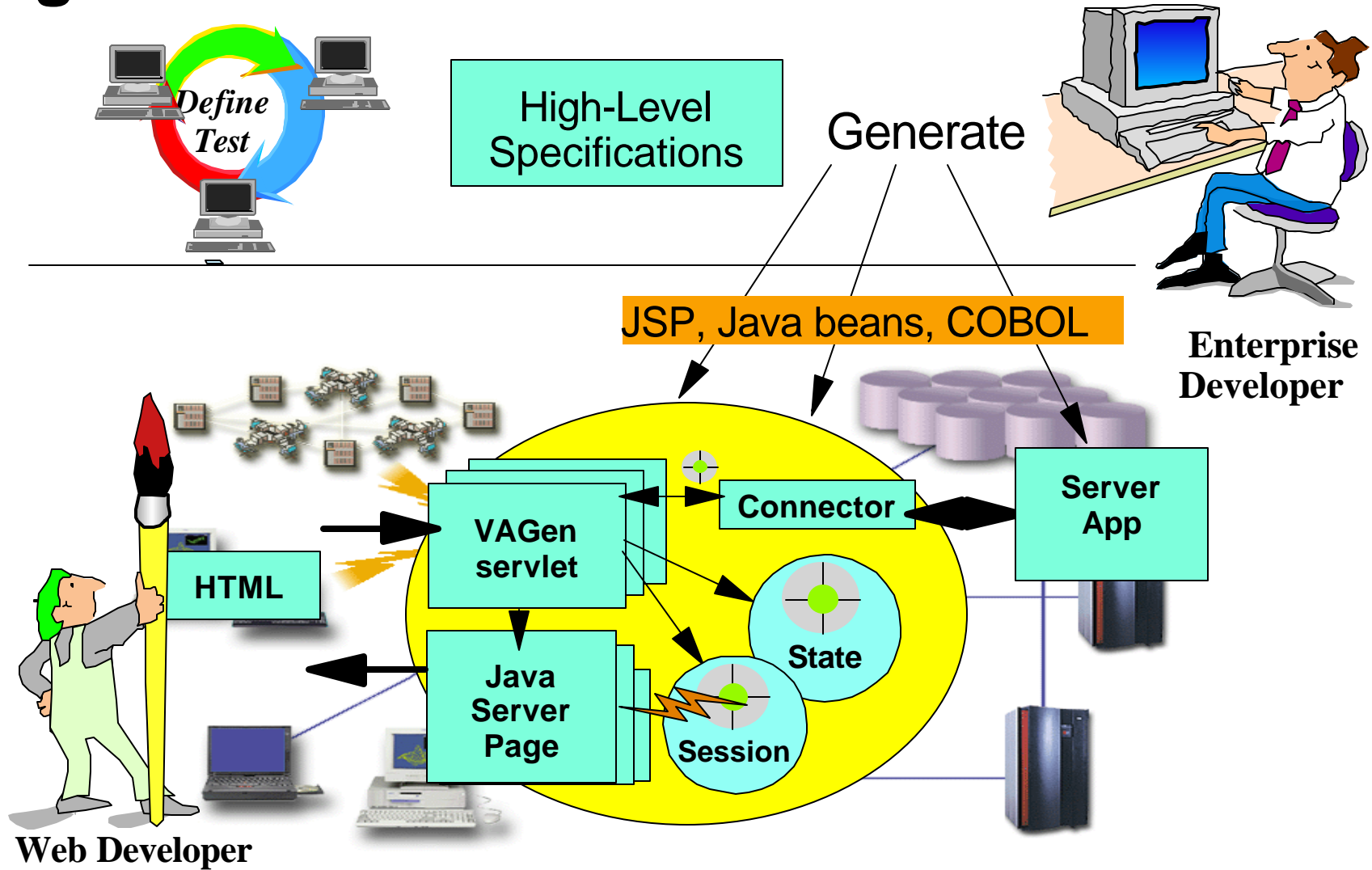
Name	Occurs	Type	Length	Decimals	UI Type	UI Properties	U
MQMANAGER	1	Char	48	0	Input/Output	Custom	↑
MQQUEUE	1	Char	48	0	Input/Output	Custom	↑
MESSAGE	20	Char	79	0	Output	Custom	↑
PUT_MESSAGE	1	Char	50	0	Input/Output	Custom	↑
PUT_MESSAGE_COUNT	1	Bin	4	0	Input/Output	Custom	↑
GET_MESSAGE_COUNT	1	Bin	4	0	None	None	↑
ERROR_MESSAGE	1	Char	79	0	Output	Custom	↑
GET_BUTTON	1	Char	4	0	Submit	Custom	↑
PUT_BUTTON	1	Char	4	0	Submit	Custom	↑
END_BUTTON	1	Char	4	0	Submit	Custom	↑
BUTTON_VALUE	1	Char	4	0	None	None	↑

Iterative Development & Test

- Animate logical specification
 - ▶ no compilation required
 - ▶ partial definition for prototyping
 - ▶ change code on the fly during test
- Full control of test execution
 - ▶ control, breakpoints, watchpoints,
 - ▶ monitor execution and test coverage
 - ▶ display / Modify storage
- Independent of runtime environment
 - ▶ end-to-end functional verification on workstation
 - ▶ access to remote CICS applications
 - ▶ access to remote data - DB2, VSAM, DL/1

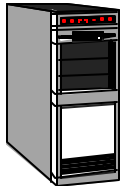


Automated Generation for target environment



Provide PC - Mainframe Scaleability

Scale UP!

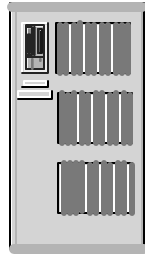


PC Servers

OS/2*

Windows NT/2000*

UP!



Midrange Servers

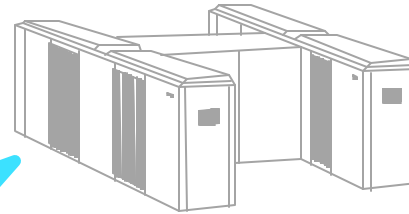
AIX*

HP-UX

OS/400*

Sun Solaris*

and AWAY!



S/390 Servers

VSE

OS/390*

VM

* Supported WebSphere Application Server targets + Linux/390

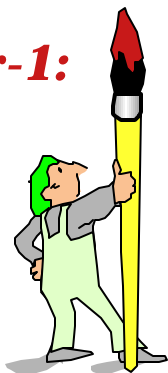
e-Business RAD Demo

- Let's See VisualAge Generator in action
 - ▶ Simple high-level specifications
 - ▶ Iterative development and test
 - ▶ Multiple generation targets

e-Business RAD Benefits

- "Fast path" for traditional programmers
 - ▶ No Java knowledge required
 - ▶ Handles web challenges
 - ▶ Simple and familiar programming approach
- Clear separation of concerns
 - ▶ Web user interface from business data/rules
 - ▶ Shields developer from Web UI design/development

Tier-1:



Web Developer



Tier 2 & Tier-3:

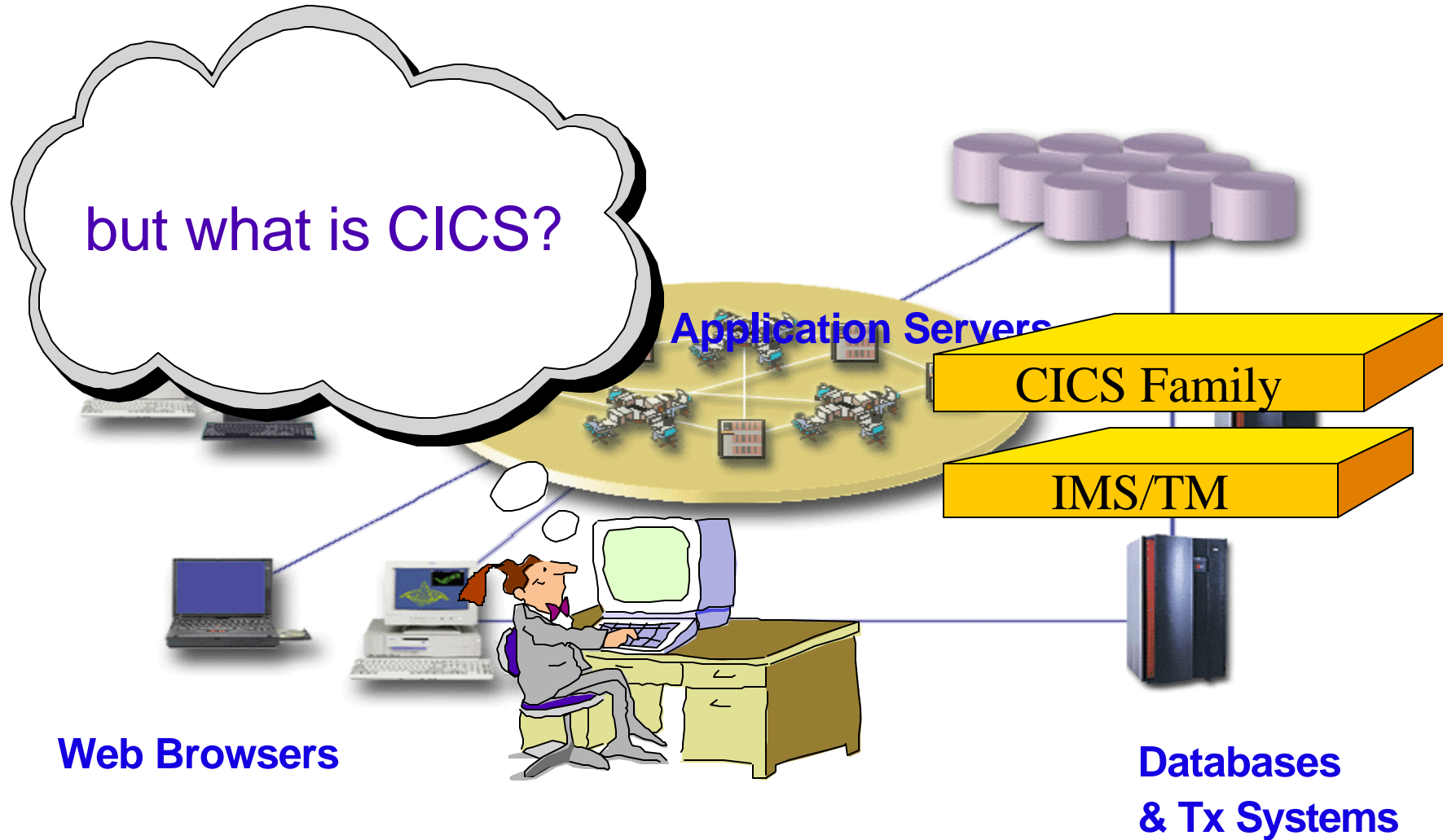


Enterprise Developer

Application Development Challenges

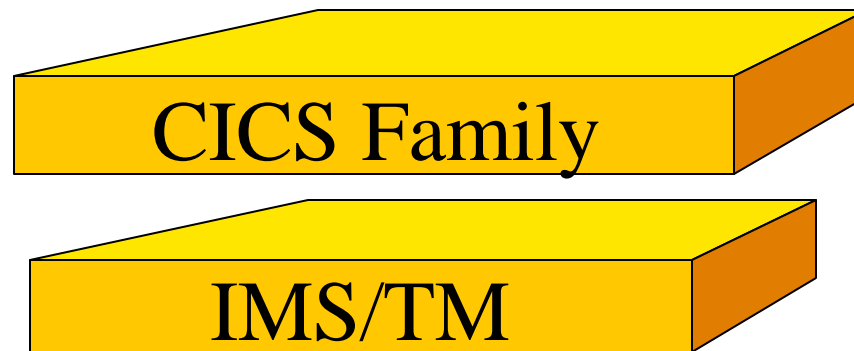
- How can I leverage my staff's current **skills** while moving to a distributed, web enabled world?
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"I have Java Skills..."



Tier 3 Server Development

- Transaction Support Made Easy!
 - ▶ An answer to the lack of CICS and IMS skills available



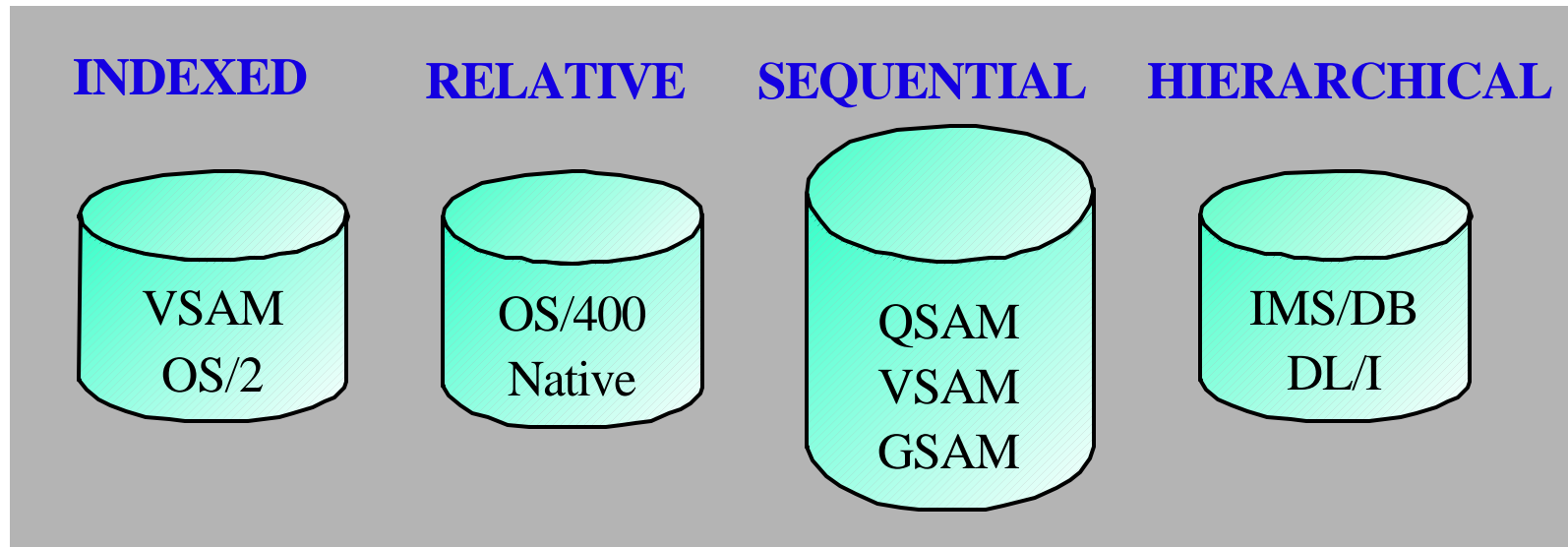
- Define with High-level specifications
- CICS or IMS/TM code automatically generated

Application Development Challenges

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Legacy Support

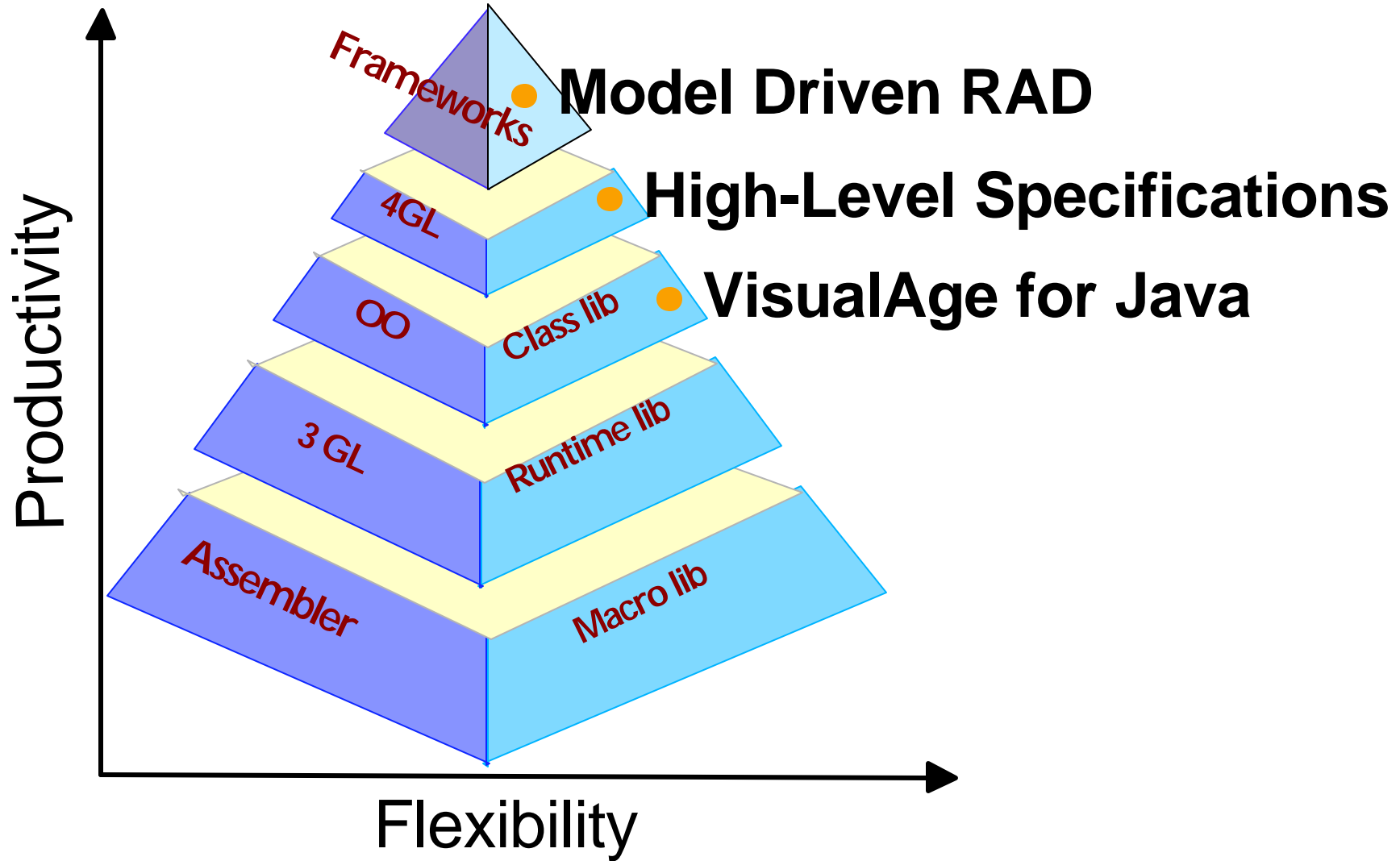
- Create green screen (3270, 5250, ASCII) and batch applications
- Integrate with existing applications
- Access legacy data



Application Development Challenges

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VisualAge Generator Developer



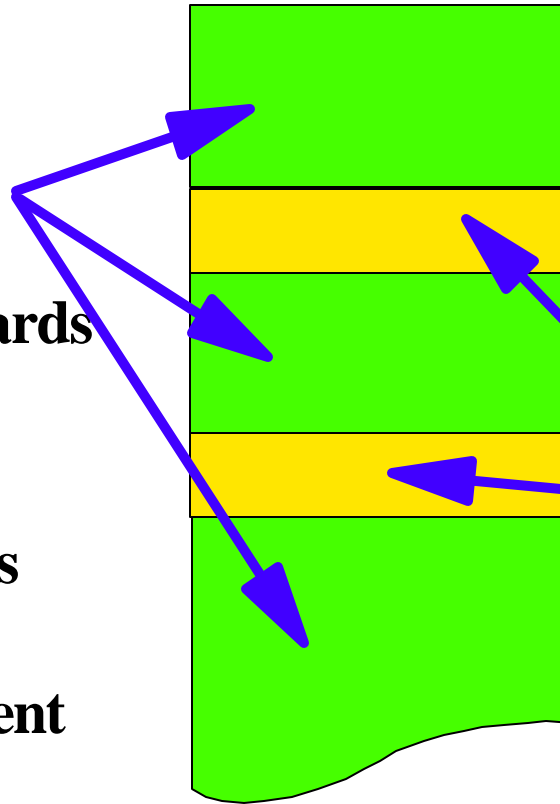
What is all that code?

80%

Infrastructure

- I/O Handling
- Error Routines
- Corporate Standards
- On-line Help
- Navigation
- Concurrent access Management
- Paging management

Typical Program



20%

Business Logic

Model Driven RAD - Templates Application Builder

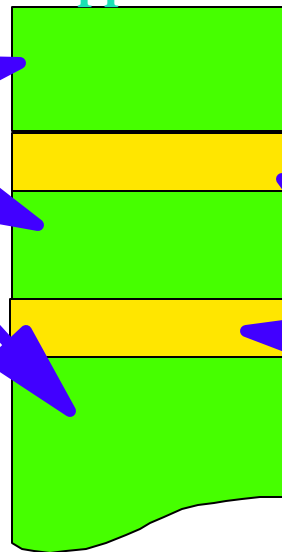
- "Factory" approach to creating applications from data model
- Generates up to 80-100% of the application code
- Developer focuses on unique business logic
- Extend, modify generation engine

Template Code!

- GUI, TUI, Web transactions, Servers
- I/O Handling
- Error Routines
- Corporate Standards enforced
- Error Free, pre-tested code
- Guarantee high quality code
- On-line Help
- Navigation
- Concurrent access Management
- Paging management

80%

VisualAge Generator Application

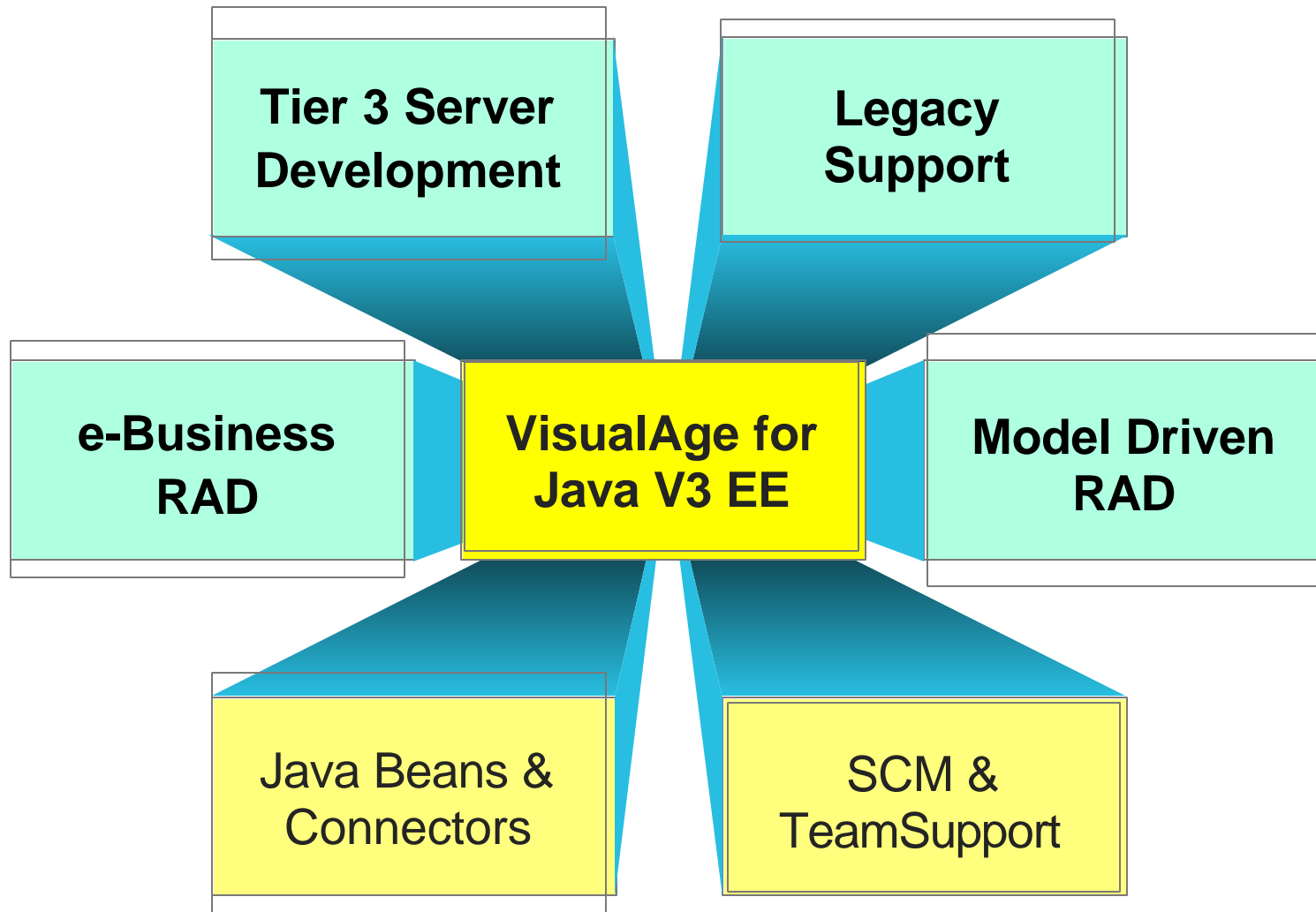


Your Business Logic

- Hooks before I/O logic
- Hooks after I/O
- Customize in VAG Developer
- Test is focused on your code

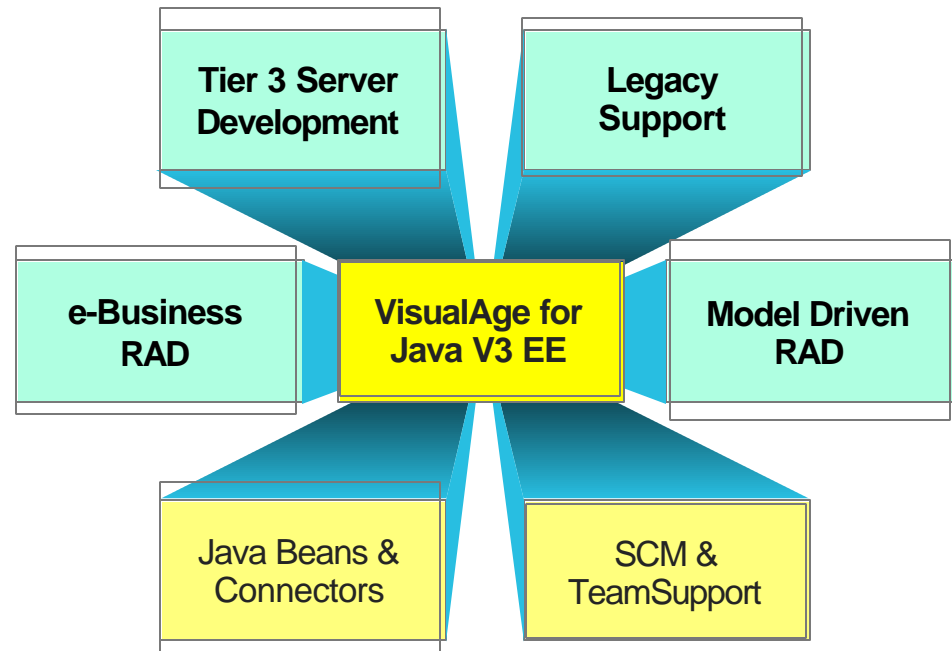
20%

Single Development Tool



VisualAge for Java Integration

- Library Services
 - ▶ Software Configuration Management
 - ▶ Version control
 - ▶ Team Development
- Components
 - ▶ Java beans
 - ▶ Enterprise Java Beans
- Facilitates skills transition
 - ▶ Productive immediately
 - ▶ Build Java skills gradually



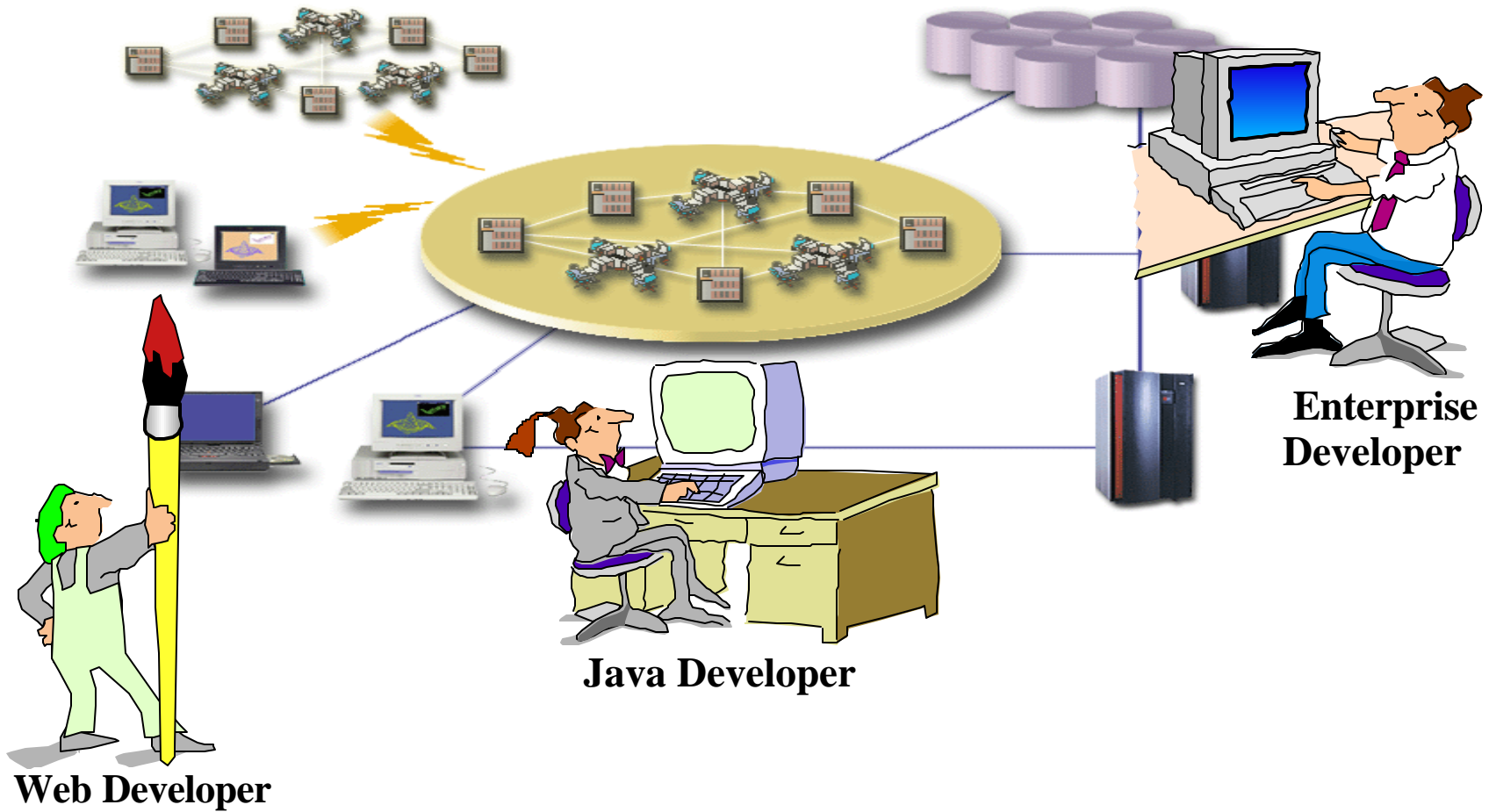
Java Server Generation

- 4GL transformed into Java server programs
 - ▶ Invokable from any Java client
 - ▶ Access bean generation to facilitate invocation
 - ▶ Run on Windows 2000/NT
- Generation of improved Session EJB
- Database access via JDBC
- Can call C++ or COBOL programs
- Includes MQ Rapid Application Creation support
- Includes Web Rapid Application Creation support

Benefits:

- ▶ Ability to build complete end-to-end Java system with little or no Java skill

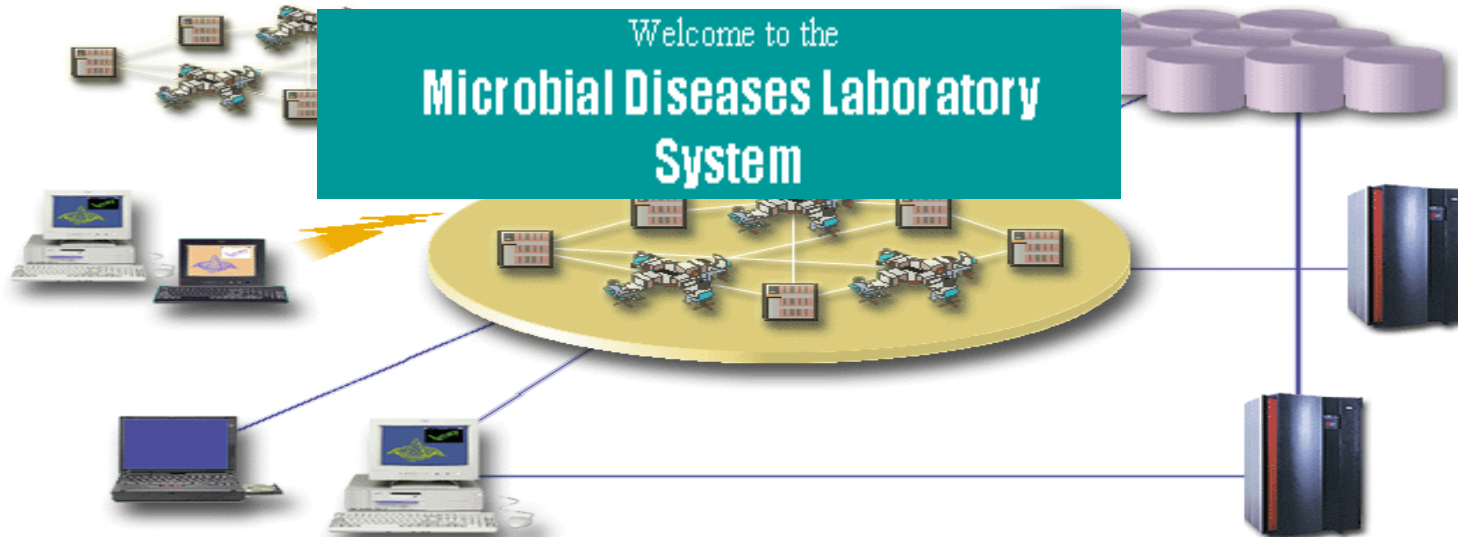
Cooperative Development



State of California - DHS



- 6 new programmers, 3 weeks of education
- 8 weeks of development, 4 weeks of testing
- RTP Services provided team lead
- Live in less than 6 months



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High Productivity

- High-level specifications
 - ▶ Hides systems complexities
 - ▶ Reduced coding
- Iterative Development and Test
 - ▶ Test on workstation, no edit-compile-test
 - ▶ Independent of target environment
- Templates Application Builder
 - ▶ Complete applications from data model
 - ▶ Creates Text, GUI, Web applications
- Integrated Development Environment
 - ▶ Version Control, SCM
 - ▶ Team Programming

Product Directions* - 2001 and Beyond

- e-Business and Object Technology
 - ▶ Generation of Java for additional server environments
 - ▶ Integration with e-business AD framework
 - ▶ Support for XML, *ML - support other client devices, B2B
- Productivity
 - ▶ Additional language enhancements
- Platforms
 - ▶ Linux as client, server and development platform

* Note: Product plans are subject to change

VisualAge Generator Packaging

VisualAge Generator Developer

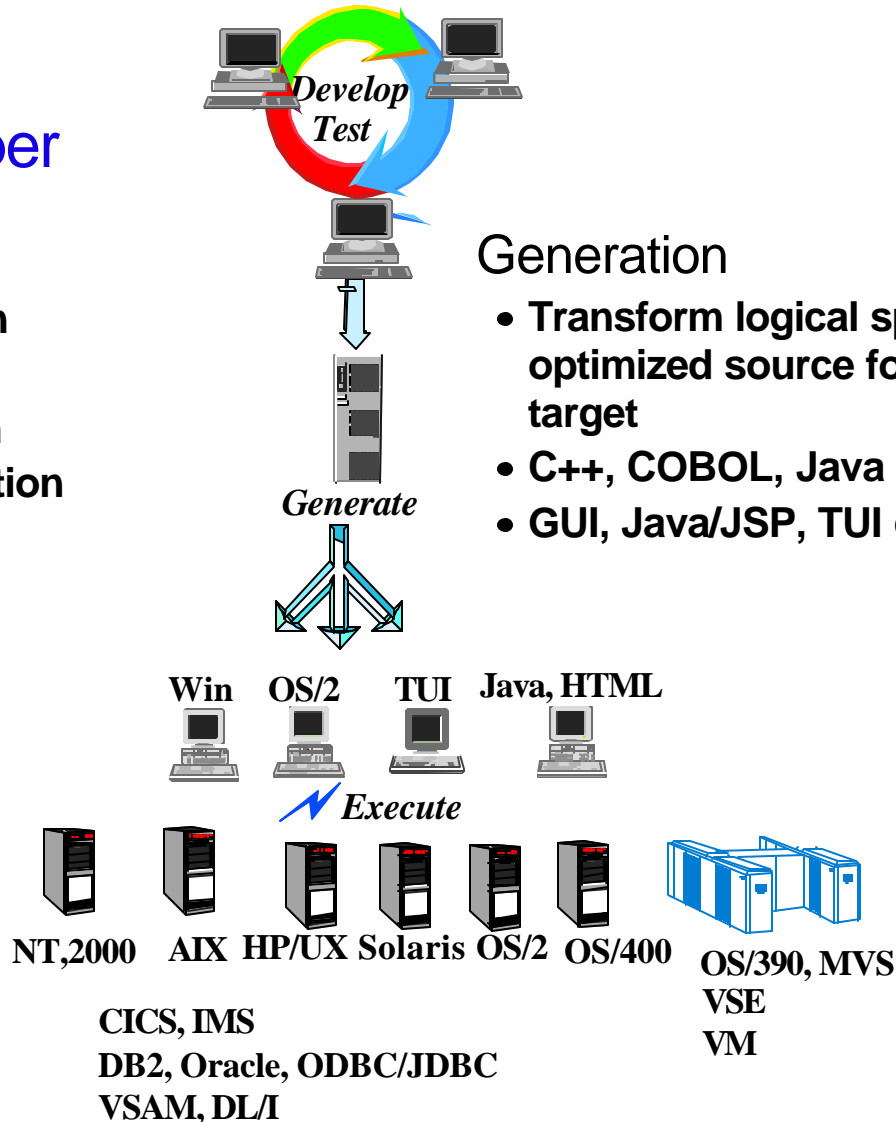
Rapid Development & Test

- High level abstraction specification
- Target platform neutral
- Shield complexity of target system
- Interactive test of logical specification
- Strong Team support

VisualAge Generator Server

Execution

- Exploit Transactional Systems
- Multiple execution Platforms
- Middleware transparency



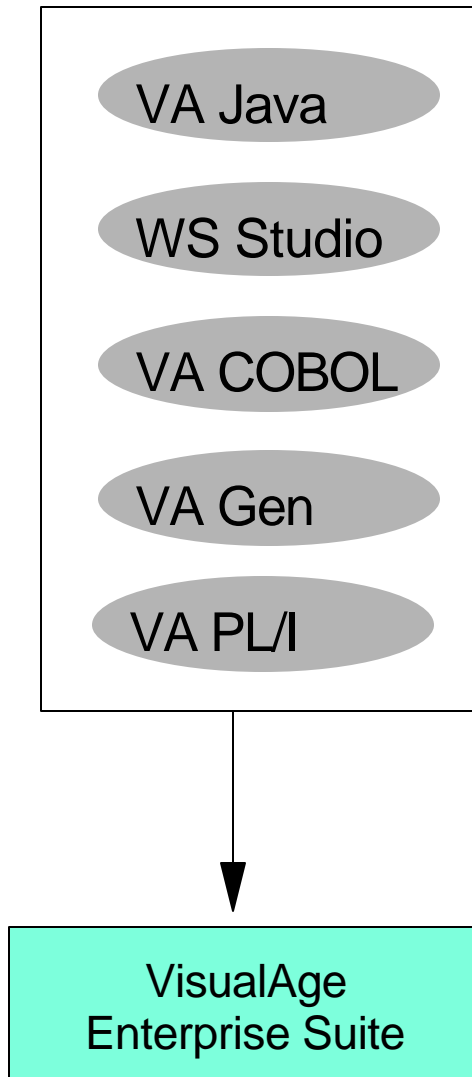
Packaging - for developing applications

- VisualAge Generator Developer V4.5
 - ▶ One for each developer
 - ▶ Product packaging contains:
 - ▶ VisualAge Generator Developer V4.5
 - ▶ VisualAge for Java, Enterprise Edition V3.5 (NT)
 - ▶ VisualAge Smalltalk Enterprise V5.0 (NT, OS/2)
 - ▶ VisualAge Generator Server- Single User License
 - ▶ May upgrade VA Generator Developer, VA Smalltalk or VA Java
 - ▶ Also part of the VisualAge Enterprise Suite product
- VisualAge Generator Templates Customizer V4.5
 - ▶ Optional
 - ▶ One for each developer who will customize Templates

Packaging - for executing applications

- VisualAge Generator Server product
 - ✓ one for each runtime server
 - ▶ VisualAge Generator Server for OS/2, AIX, Win NT, HP-UX & Sun Solaris V4.5
 - ▶ VisualAge Generator Server for OS/390, MVS, VSE and VM V1.2
 - ▶ VisualAge Generator Server for AS/400 V4R4
- WebSphere Application Server
 - ▶ Standard or Advanced
 - ▶ V3.0 or later
 - ▶ Windows NT/2000, AIX, Sun Solaris, AS/400, OS/390, Linux/390

Packaging - VisualAge Enterprise Suite

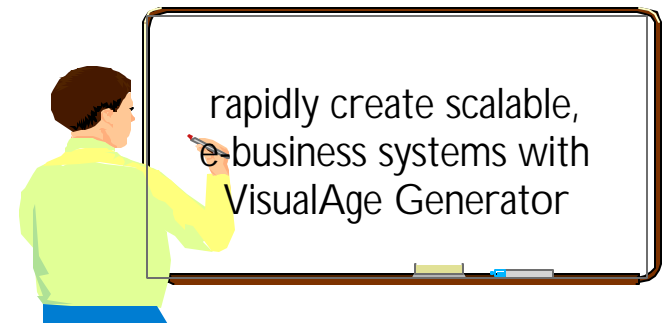


- Single Package Price
 - ▶ VisualAge Generator, COBOL, PL/I, VisualAge for Java, WebSphere Studio
- Customer Value
 - ▶ Optimize I/T Expenditure
 - ✓ Each developer can use any of the tools in the package
 - ✓ Eliminate shelfware - no risk to buy now
 - ▶ Gain organizational flexibility
 - ✓ Uniform tool set allows customer to redeploy AD resources based on changing business needs

Services Offerings

- Education - Introduction, Transition
- Installation & Customization
- VisualAge Generator Application Development
- Developing e-business applications
- Migrations:
 - ▶ To Version 4.5
 - ▶ From CSP or VisualAge Generator
 - ▶ From MSLs to the team programming environment
- Quickstarts
- Design Reviews
- Performance Tuning
- Mentoring
- Templates Customization

- **VisualAge Consulting Services Team**
 - AIM Services/Raleigh/IBM@IBMUS
- **Highly skilled IBM Business Partners**



A Growing Success

Consultants & Awards

IDC: Setting the standards..
Realware "best use of obj tech"
Finalist in other competition
In Gartner's Leadership quadrant
Top market share in Standish
Minimize Risk (Hurwitz)
Product review (SDC
State of California CIO award
Beyond Computing top 10 award)

Industry Usage

3000+ heritage installations
1200+ new enterprise purchases
43 US states, 54 countries
All commercial business
segments
All levels of Government
All types of colleges &
universities

Implementations

Banco Itau, Brazil
State of California - Dept. of Health Svcs
Novahut, Czech Republic
Realkredit, Denmark, 2-tier Flexloan
Danka, US - Win-IMS, MQ, Notes, Java
Russia Pension Fund, 3-tier, MQ
Hyundai Motor Corp, Korea.
Vital Processes, Inc.
Qantas Airlines
Nikkon Optical
Oregon Judicial Department

Services

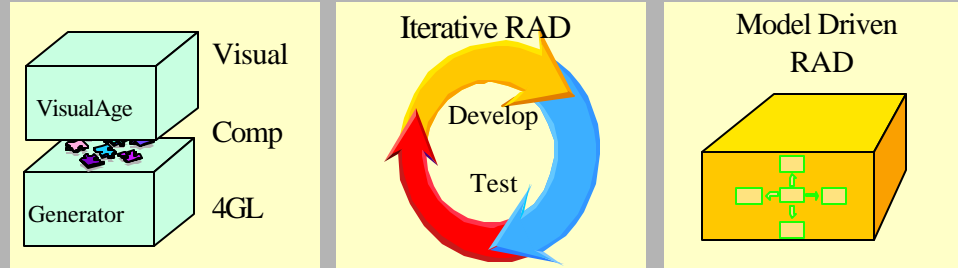
Network of 100+ service providers
Lab-based WW VA Gen services team
IGS VAGen practices
COBOL to VAGen conversion tools

What's Next

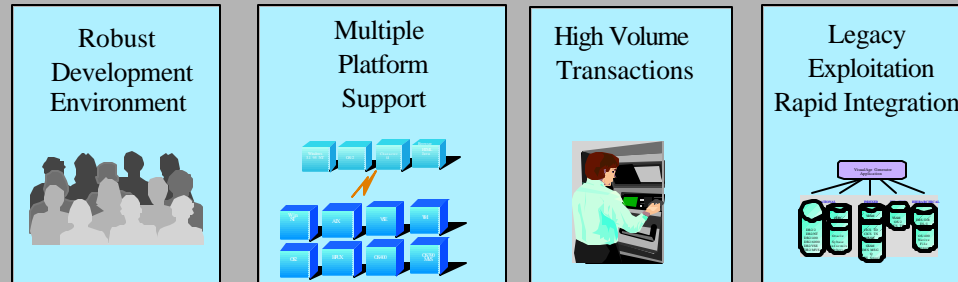
- Read:
 - ▶ IDC Report:
www-4.ibm.com/software/ad/analysts/idcvisgen4.html
 - ▶ VisualAge Generator White Paper
www-4.ibm.com/software/ad/visgen/library/vg40overview.pdf
- Visit our web site
 - ▶ www.ibm.com/software/ad/visgen
 - ▶ Subscribe to our Newsletter
 - ▶ Case Studies, product documentation, white papers
- Visit the Redbooks site
 - ▶ www.redbooks.ibm.com
 - ▶ search on 'VisualAge Generator'

VisualAge Generator Summary

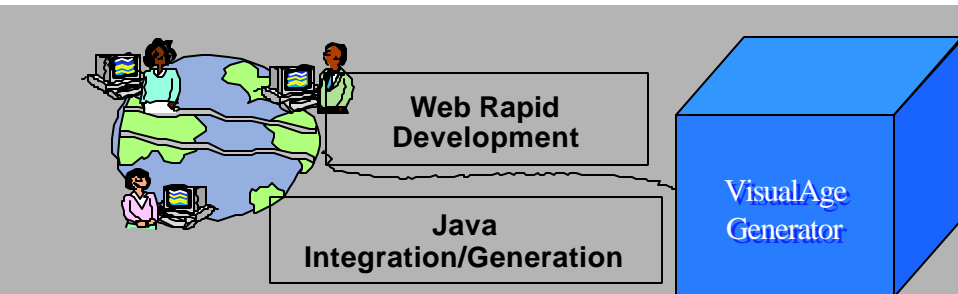
High Productivity



Enterprise Breadth



e-business Enablement

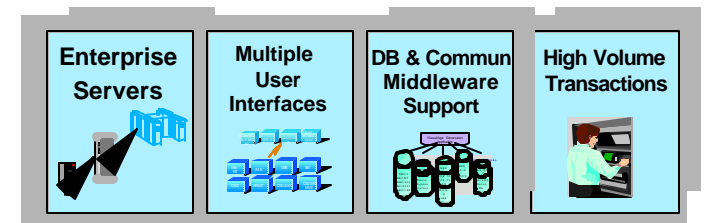


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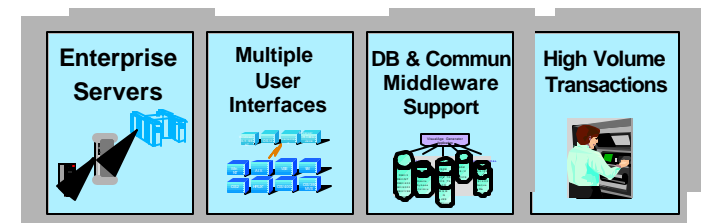
Individual-to-Enterprise Breadth

- Enterprise Servers
 - ▶ Scale Up from workstation to enterprise server
 - ▶ Write once, generate for Win NT, OS/2, AIX, HP-UX, Sun Solaris, OS/400, OS/390(MVS), VSE, and VM
 - ▶ n-Tier Application Partitioning
- User Interface Support
 - ▶ HTML Browser - uses Java Servlets and Java Server Pages
 - ▶ Java Applets
 - ▶ Graphical User Interface for Win NT, Win 95/98, and OS/2
 - ▶ Text - 3270, 5250, ASCII



Individual-to-Enterprise Breadth (*continued*)

- Database and Communications Middleware Support
 - ▶ DB2, Oracle, ODBC, JDBC
 - ▶ DL/I, VSAM, OS/400 native files, sequential, etc.
 - ▶ SNA, TCP/IP, MQSeries, CICS, DCE, CA/400
- High Volume Transactions
 - ▶ Generate for CICS, IMS
 - ▶ Generate Optimized source code
 - ▶ Builds robust OLTP applications



e-business Enablement

- Business Integration support
 - ▶ Supports MQSeries application development
 - ✓ No MQ API knowledge required
- End-to-end e-business application development
 - ▶ Supports WebSphere application servers
 - ✓ Little or no Java skills required
- VisualAge for Java Integration
 - ▶ Team programming and Library management support
 - ▶ Generation of Java Clients and Java Servers
 - ▶ Generation of Session Enterprise JavaBeans
 - ✓ Allows Java clients (servlets, JSPs, applications, EJBs) to call VisualAge Generator servers via an EJB session bean