IBM Software

UKInnovate2010

The Rational Software Conference

Smarter software for a smarter planet.

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The Rational Software Conference

Simplify modern business application development with EGL

Will Smythe, IBM

Smarter software for a smarter planet.

Agenda

Introduction to EGL

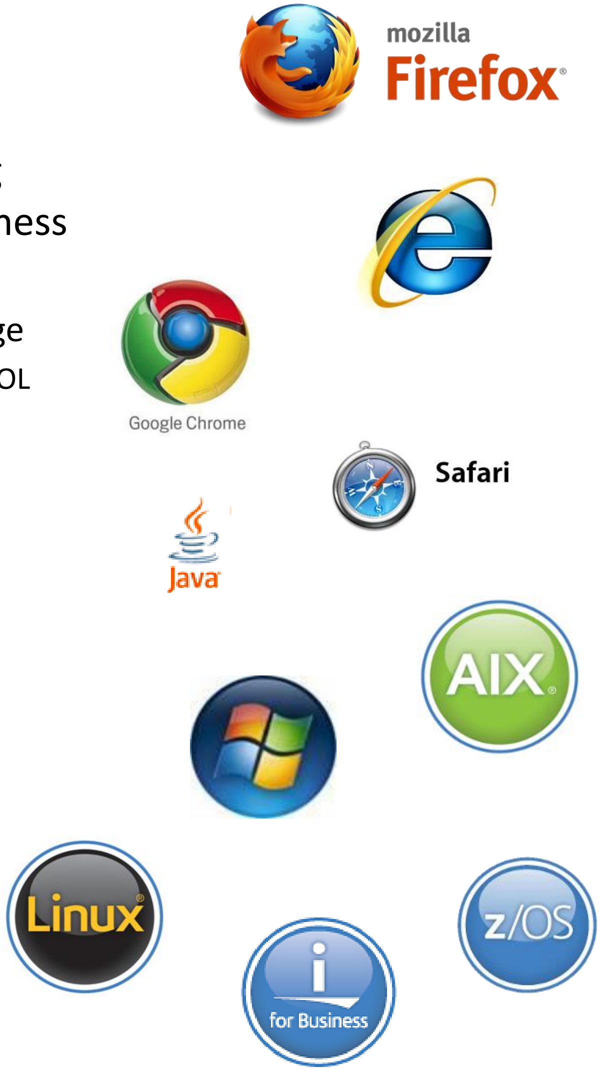
Application migration with Rational Migration Extension

EGL open source strategy

Next steps

Simplify Innovation with EGL

- EGL, IBM’s newest business language, is a higher-level programming language designed for simplifying development of modern business applications
  - Supports development of server and client side logic in a single language
    - Code deploys natively throughout the enterprise as Java, JavaScript, or COBOL
  - Shields developers from the complexities of runtime environments
    - Allows developers to focus on business needs
  - Ideal for all types of developers
- EGL is modern
  - Web 2.0 and SOA built-in
  - Eclipse and Jazz based tools
- EGL is an excellent target migration language



Why EGL?

Skills
Allows developers to focus on business problems, not technology problems

Platform Flexibility
Delivers maximum platform and runtime independence

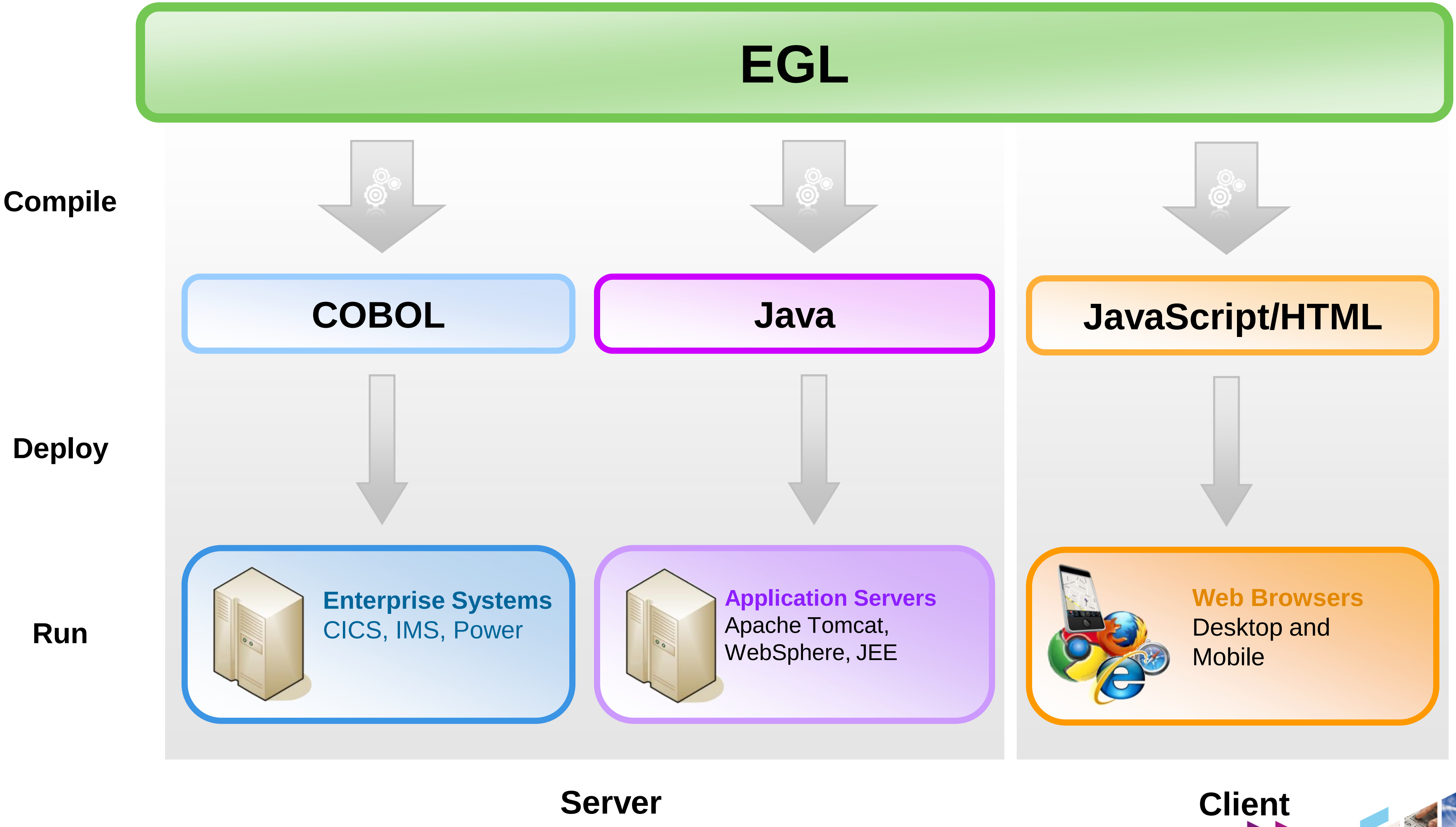
EGL

Productivity
Allows developers to focus on business problems, not technology problems

Modern
Eclipse-based tools simplify development of Web 2.0 style applications and Web services

Adaptability
Delivers a modern language that evolves as technologies and runtimes change

A common language for the enterprise



EGL

Compile

COBOL

Java

JavaScript/HTML

Deploy

Run

Enterprise Systems
CICS, IMS, Power

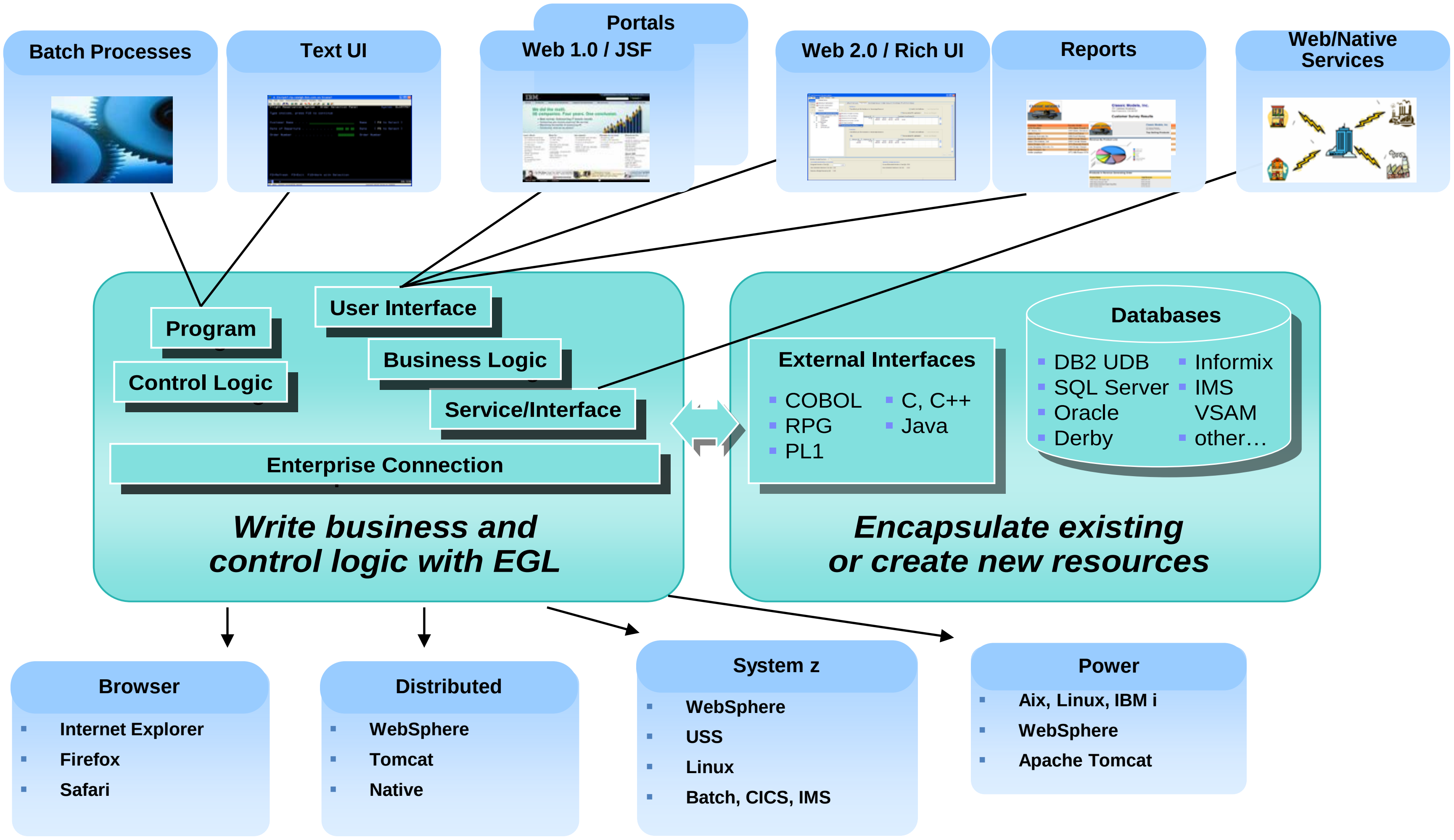
Application Servers
Apache Tomcat, WebSphere, JEE

Web Browsers
Desktop and Mobile

Server

Client

Respond to Broadest Application Needs



Batch Processes

Text UI

Portals

Web 1.0 / JSF

Web 2.0 / Rich UI

Reports

Web/Native Services

Program

Control Logic

User Interface

Business Logic

Service/Interface

Enterprise Connection

Write business and control logic with EGL

External Interfaces

- COBOL
- RPG
- PL1
- C, C++
- Java

Databases

- DB2 UDB
- SQL Server
- Oracle
- Derby
- Informix
- IMS

VSAM

other…

Encapsulate existing or create new resources

Browser

- Internet Explorer
- Firefox
- Safari

Distributed

- WebSphere
- Tomcat
- Native

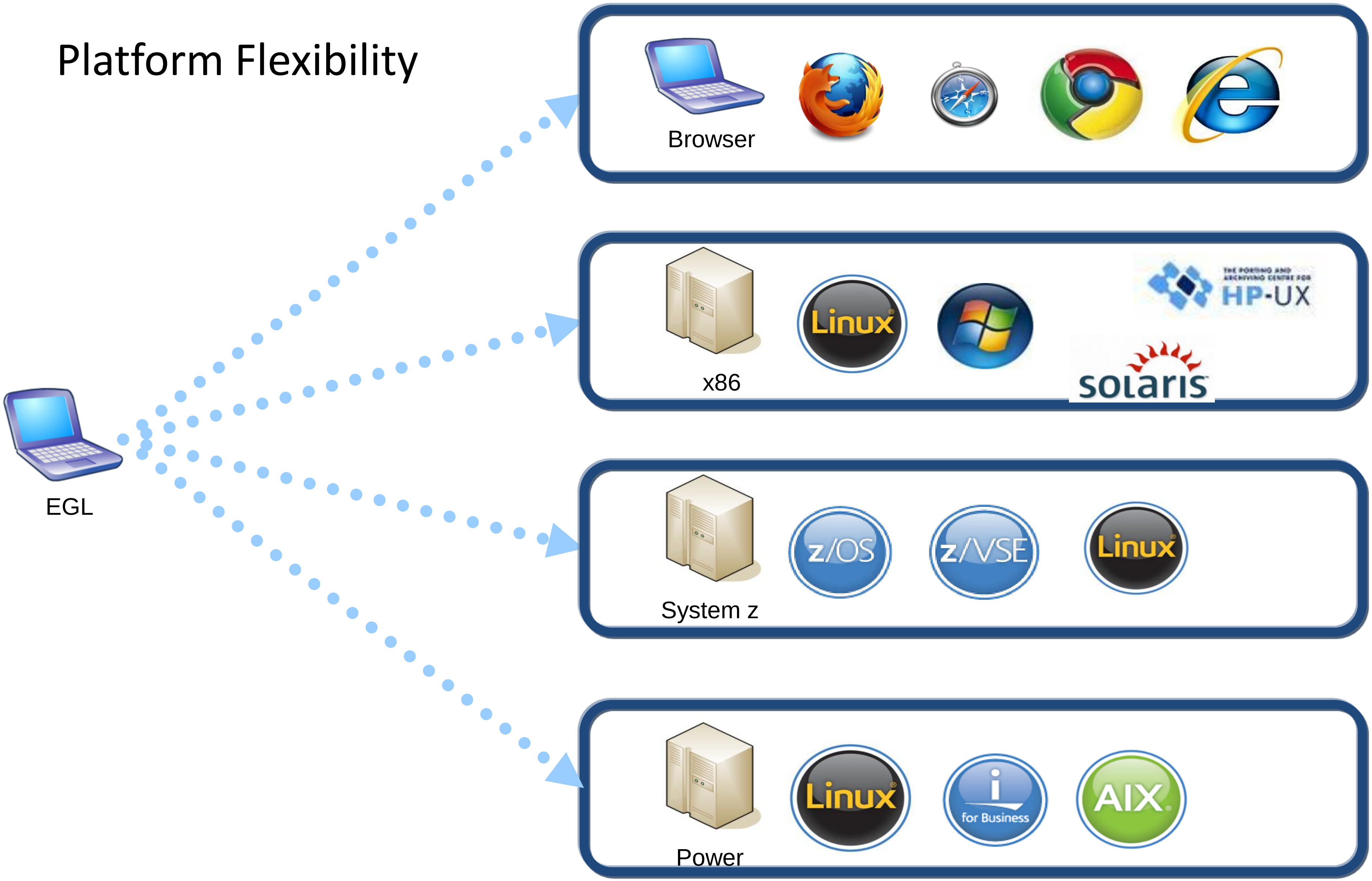
System z

- WebSphere
- USS
- Linux
- Batch, CICS, IMS

Power

- Aix, Linux, IBM i
- WebSphere
- Apache Tomcat

Platform Flexibility



EGL

Browser

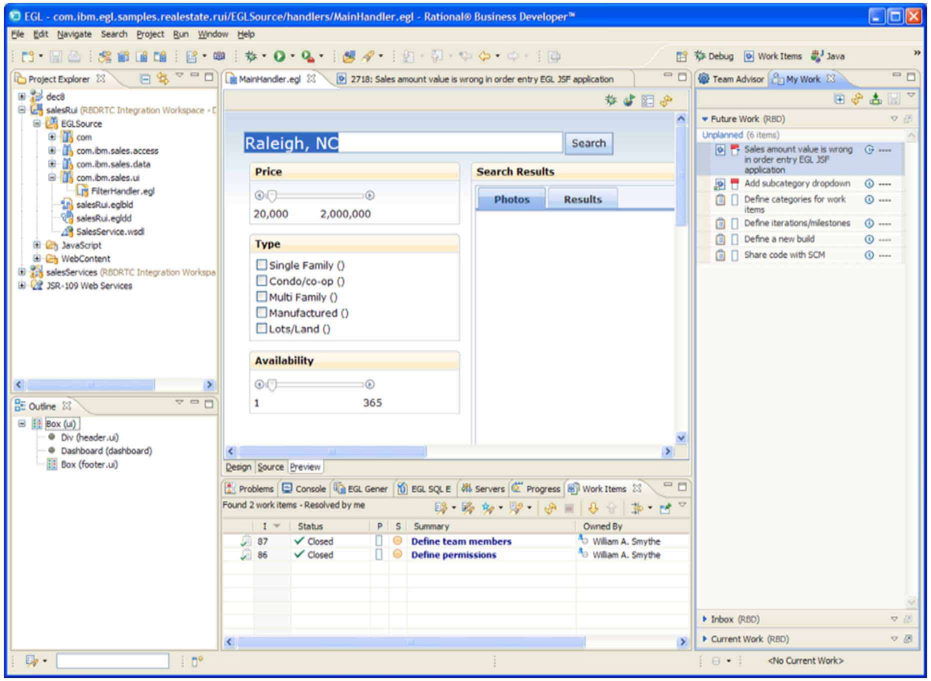
x86

System z

Power

Rational Business Developer

- Simplify the development of EGL Web, Web 2.0, Text UI, and SOA solutions with Rational Business Developer
  - Built on Eclipse
  - Supports integration with other Rational tools
- Features
  - Visual and source editors
  - Code completion, templates, and snippets
  - Service generation for database tables
  - SQL visualization and editing
  - References and declarations
  - Open on selection
  - Refactoring
  - Cheat sheets and dynamic help
- Debug EGL code within the IDE



EGL - com.ibm.egl.samples.realestate.rui/EGLSource/handlers/MainHandler.egl - Rational® Business Developer™

2718: Sales amount value is wrong in order entry EGL JSF application

Raleigh, NC

Price: 20,000 – 2,000,000

Type
- □ Single Family ()
- □ Condo/co-op ()
- □ Multi Family ()
- □ Manufactured ()
- □ Lots/Land ()

Availability: 1 – 365

Future Work (RBD) – Unplanned (6 items)
- Sales amount value is wrong in order entry EGL JSF application
- Add subcategory dropdown
- Define categories for work items
- Define iterations/milestones
- Define a new build
- Share code with SCM

Found 2 work items - Resolved by me

I	Status	P	S	Summary	Owned By
87	✓ Closed			Define team members	William A. Smythe
86	✓ Closed			Define permissions	William A. Smythe

<No Current Work>

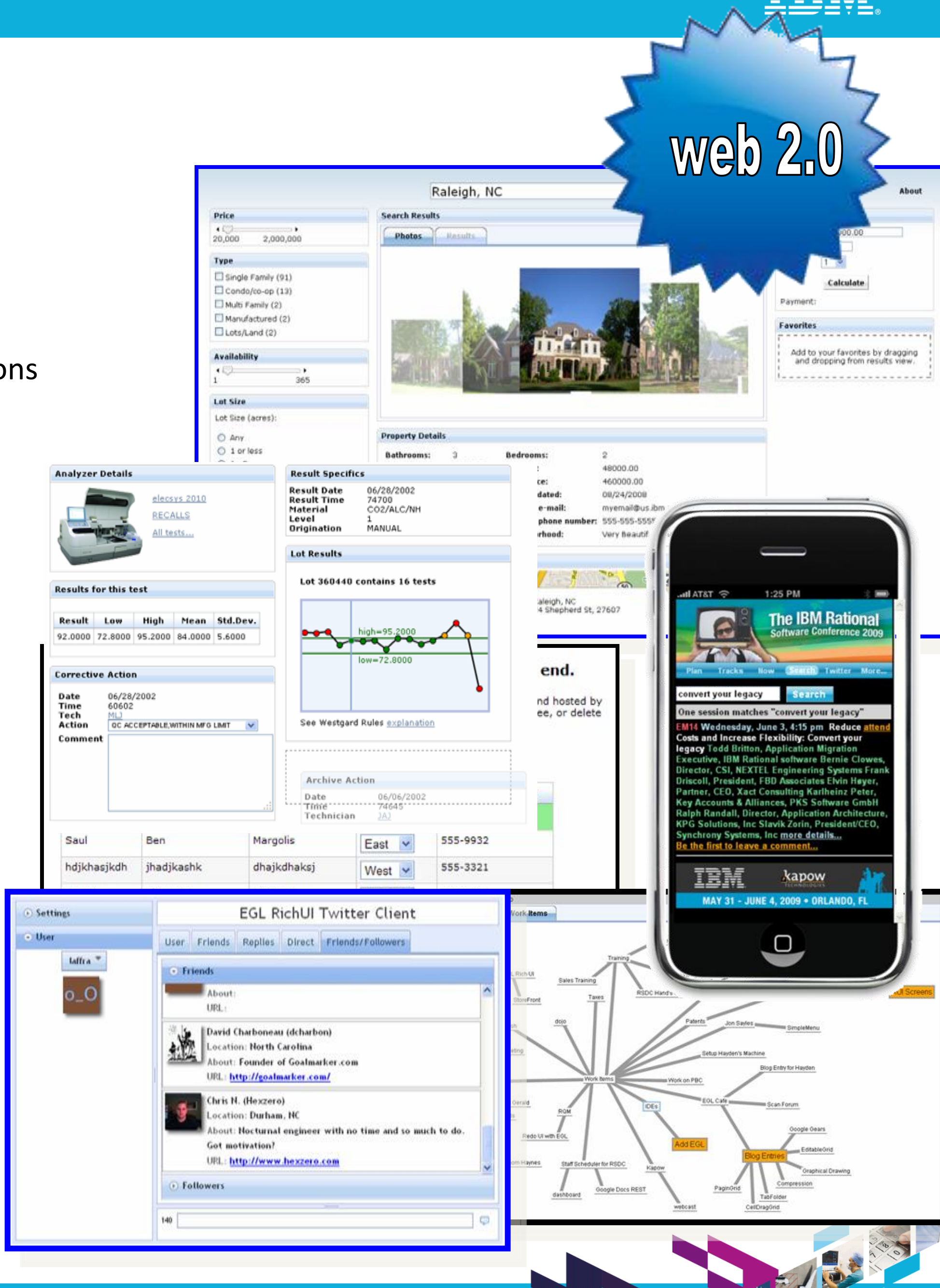
Integrate with Rational Team Concert / Jazz

- EGL development teams can take advantages of the capabilities provided by Jazz/Rational Team Concert to manage EGL development projects

jazz

Web 2.0 with EGL

- Simplify creation of Rich Internet Applications
  - Deliver end-to-end Web 2.0 quickly in a single language
  - Build rich user interfaces to modernize existing applications
- Compiles into standard JavaScript and Ajax
  - No browser plug-ins required
  - Works with all major browsers
- Easy-to-learn for all types of developers
- Fully open and extensible
  - Utilize popular and open existing JavaScript libraries, like Dojo, Ext JS, and jQuery
- Eclipse-based development, testing, and debugging
- Consume all types of Web services


web 2.0
Raleigh, NC
Price
Type
Search Results
Photos
Calculate
Favorites
Add to your favorites by dragging and dropping from results view.
Property Details
Analyzer Details
Result Specifics
Results for this test
Lot Results
Lot 360440 contains 16 tests
high=95.2000
low=72.8000
Corrective Action
Archive Action
EGL RichUI Twitter Client
User Friends Replies Direct Friends/Followers
Friends
Followers
David Charboneau (dcharbon)
Chris N. (Hexzero)
The IBM Rational Software Conference 2009
convert your legacy
Search
MAY 31 - JUNE 4, 2009 • ORLANDO, FL

EGL in Action (Side-by-Side Comparison)

EGL Rich UI

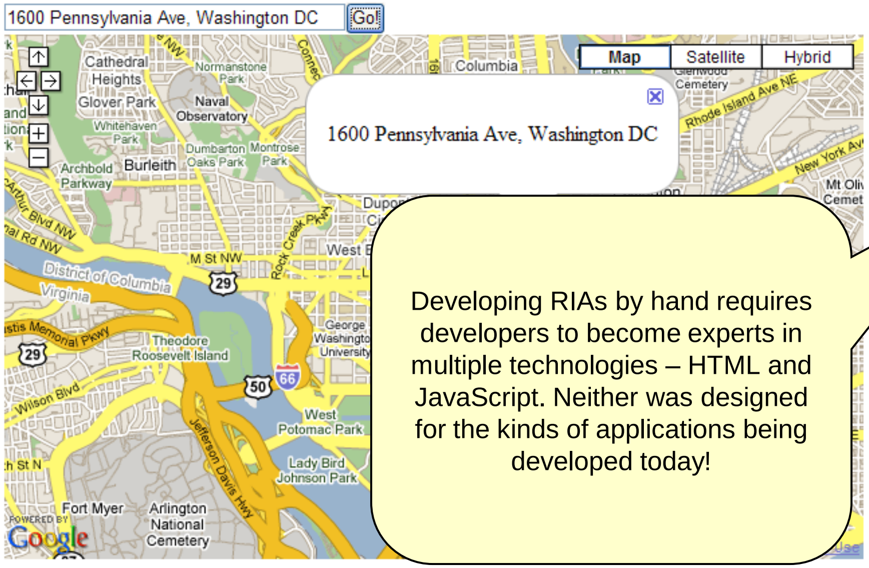
```
handler MyRuiHandler type RUIhandler { initialUI = [ addressForm, map ] }

 addressField TextField { text = "1600 Pennsylvania Ave, Washington     DC",
width = 250 };

 goButton Button { text = "Go!", onClick ::= goButton_clicked };
 addressForm Box { children = [ addressField, goButton ] };

 map GoogleMap { width = "500px", height = "300px" };

  function goButton_clicked (e Event in)
    addresses String[] = [ addressField.text ];
    map.showAddresses(addresses, addresses);
  end
end
```



1600 Pennsylvania Ave, Washington DC [Go!]

1600 Pennsylvania Ave, Washington DC

Developing RIAs by hand requires developers to become experts in multiple technologies – HTML and JavaScript. Neither was designed for the kinds of applications being developed today!

HTML and JavaScript

```
<html xmlns="http:                                      emas-microsoft-com:vml">
  <head>
    <meta http-equ                                      rset=UTF-8"/>
    <title>Google                                       >
    <script src="h                                      =2.x
    <script type="



    function initia
      if (GBrowserIsCompatible()) {
        map = new GMap2(document.getElementById("map_canvas"));
        map.setCenter(new GLatLng(37.4419, -122.1419), 13);
        geocoder = new GClientGeocoder();
      }
    }




          func
            map.setC
            var mark
            map.addC
            marker.c
          }
        );
      }
    }
    </script>
  </head>

  <body onload="initialize()" onunload="GUnload()">
    <form action="#" onsubmit="showAddress(this.address.value); return false">
      <p>
        <input type="text" size="60" name="address" value="1600 Pennsylvania Ave,
Washington DC" />
        <input type="submit" value="Go!" />
      </p>
      <div id="map_canvas" style="width: 500px; height: 300px"></div>
    </form>
  </body>
</html>
```

All code, including UI and controller logic, is written completely in EGL.

The complexity of the Google Map APIs are hidden from the developer, so the developer can focus on the actual business requirement and not technical complexities.

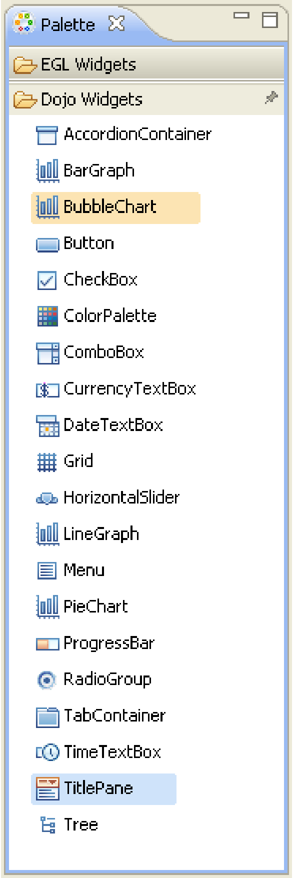
Simplify Dojo

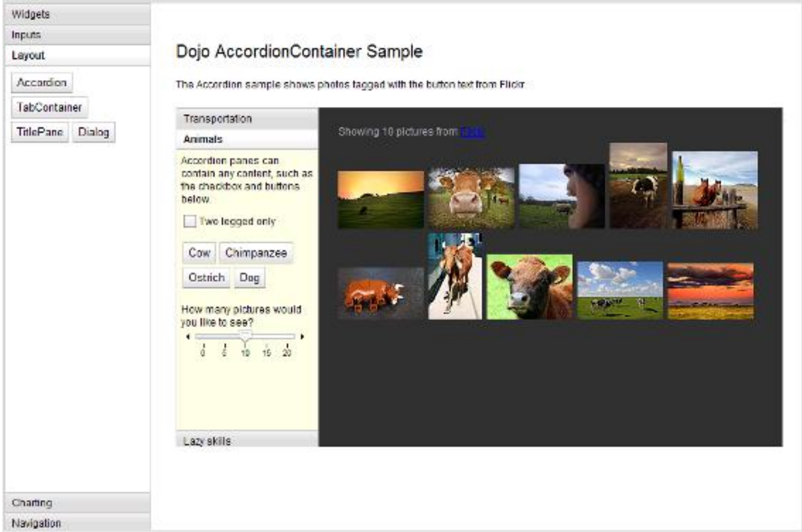
Dojo is a popular and powerful open source JavaScript widget library

EGL simplifies development of Dojo-based applications by including a Dojo widget library for EGL

- No knowledge of Dojo or JavaScript required by the developer
- Fits within the EGL programming model
  - Developers work with Dojo widgets just like any other EGL widget

Sample code provided for each widget





Dojo AccordionContainer Sample

The Accordion sample shows photos tagged with the button text from Flickr

Accordion panes can contain any content, such as the checkbox and buttons below.

□ Two legged only

How many pictures would you like to see?

Showing 10 pictures from

APIS IT

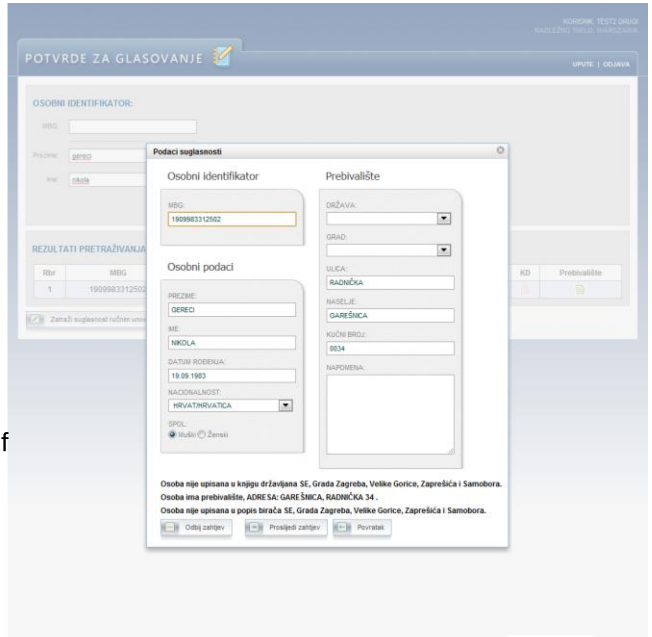
Enabling faster approval of voting rights for voters living abroad

The need:

To support Croatia's national elections, Croatia's Agency for Information Systems and Information Technologies Support (APIS IT) needed to develop a Web 2.0–based application for faster approval of voting rights for voters living abroad. The new solution had to function within an existing IT architecture, and security and accuracy were essential to ensure the credibility of election results.

The solution:

The APIS IT team created the solution using leading development, collaboration and change management software. Solution elements include a data repository based on industry-leading relational database software, a leading access management application, and a rich Web 2.0–based user interface. The team also used a security testing application to eliminate any security vulnerabilities before the solution went live.



POTVRDE ZA GLASOVANJE

UPUTE | ODJAVA

OSOBNI IDENTIFIKATOR:

MBG:

Prezime: gereci

Ime: nikola

REZULTATI PRETRAŽIVANJA

Rbr	MBG	KD	Prebivalište
1	1909983312502		

Zatraži suglasnost ručnim unos

Podaci suglasnosti

Osobni identifikator

MBG: 1909983312502

Osobni podaci

PREZIME: GERECI

IME: NIKOLA

DATUM ROĐENJA: 19.09.1983

NACIONALNOST: HRVAT/HRVATICA

SPOL: ● Muški ○ Ženski

Prebivalište

DRŽAVA:

GRAD:

ULICA: RADNIČKA

NASELJE: GAREŠNICA

KUĆNI BROJ: 0034

NAPOMENA:

Osoba nije upisana u knjigu državljana SE, Grada Zagreba, Velike Gorice, Zaprešića i Samobora.

Osoba ima prebivalište, ADRESA: GAREŠNICA, RADNIČKA 34 .

Osoba nije upisana u popis birača SE, Grada Zagreba, Velike Gorice, Zaprešića i Samobora.

> *"We managed to greatly improve the end-user experience and increase productivity, all without sacrificing application security and reliability."*
>
> *— Robert Stanko, Division Manager, APIS IT*

APIS IT d.o.o.

Key points:

- Leveraged existing "traditional developer" skills to create a modern Web 2.0 solution with EGL
- Complete IBM solution (WebSphere, DB2, Tivoli, Rational)

The need for modernization

Existing applications have “run the business” for years

Decisions made decades ago may not be the right ones for today

Govt Agency

Platform:	Unisys
Applications:	COBOL
Database:	DMS II

Technology Company

Platform:	System z
Applications:	Natural
Database:	ADABAS

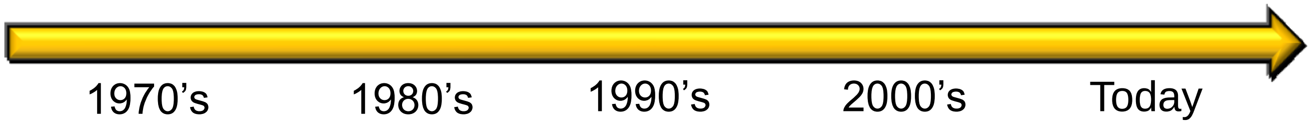
Real Estate Company

Platform:	System z
Applications:	Ideal
Database:	Datacom

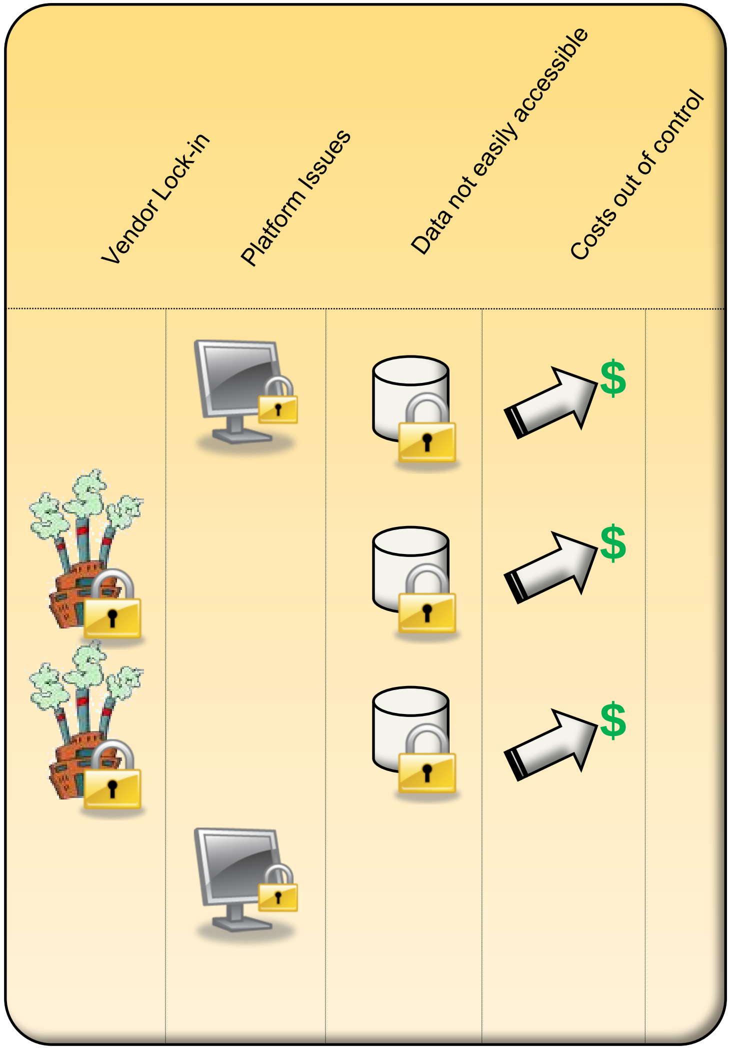
Major ISV

Platform:	System 38
Applications:	RPG
Database:	DB2

. . .

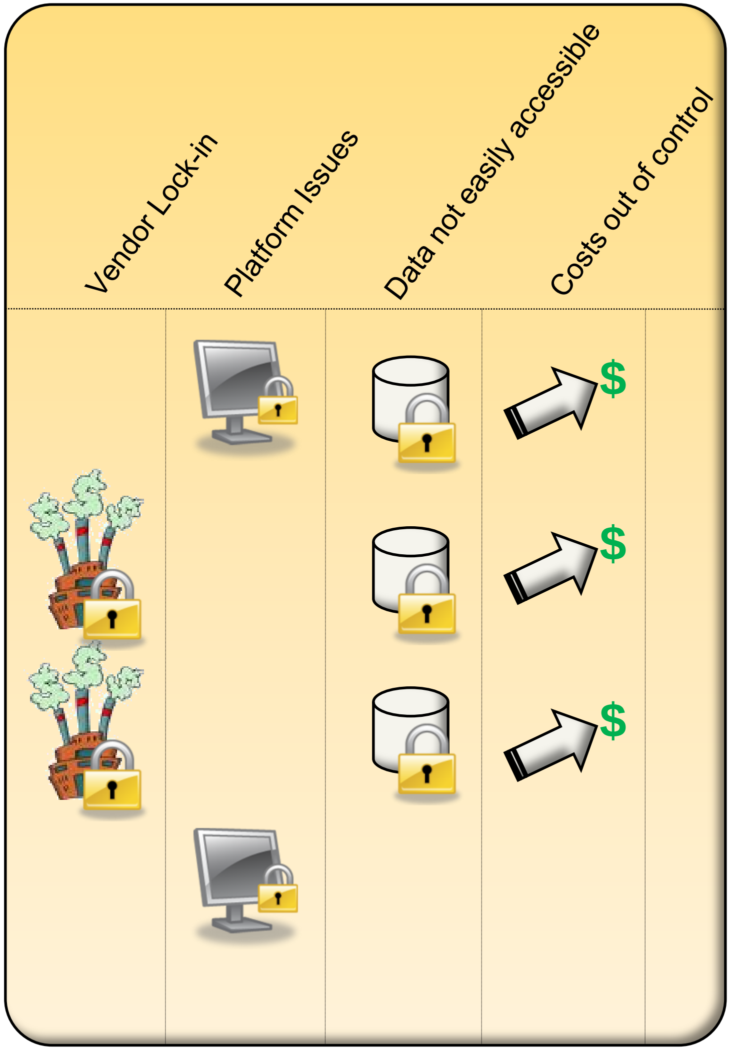


Business Problems



Possible solutions to identified problems

Business Problems



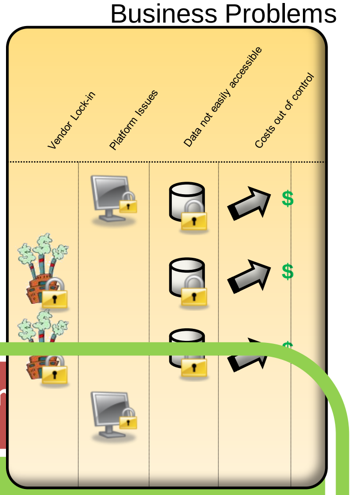
Possible solutions to identified problems

Modernization options for addressing identified business problems …

Rewrite

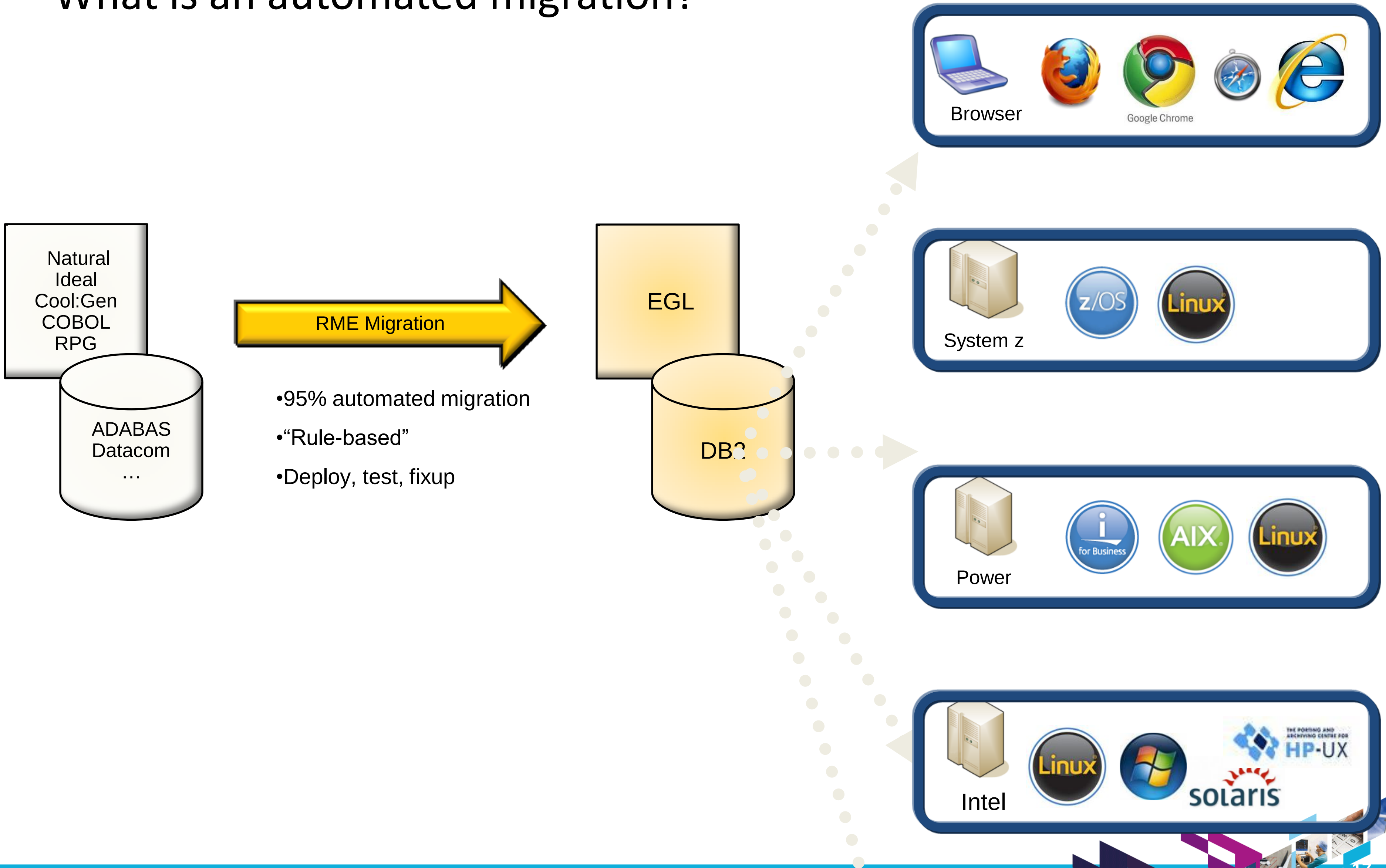
Purchase a packaged application (and customize)

Migrate


Business Problems

Criteria	Rewrite	Packaged application	Migratior
Time to Market	Slow	Medium	Fast
Cost	High ($5 - $10/LOC)	Medium	Low ($.50 - $1.50/LOC)
Risk	High	Medium	Low
Ability to make functional improvements	High	Either application improvements or business process changes	Some: Text UI to Rich Web
Ability to make Business process improvements	High	Business must adapt to new processes	Low
Key Business Drivers	**Current application doesn't meet business needs; Desire custom application that exploits defined architectures and competitive advantages**	**Reduction in I/T footprint; Leverage commodity software instead of building it**	**Quickly and economically increase application flexibility and decrease operating costs**

What is an automated migration?

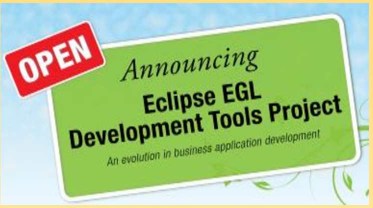


- •95% automated migration
- •“Rule-based”
- •Deploy, test, fixup

Why automated migration?

Business Problems . . . Rational Migration Solutions

Vendor Lock-in

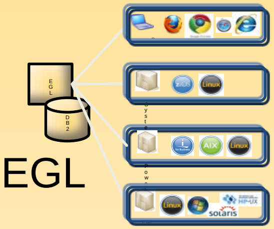

OPEN

Announcing

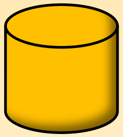
Eclipse EGL Development Tools Project

An evolution in business application development

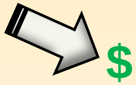
Platform Issues



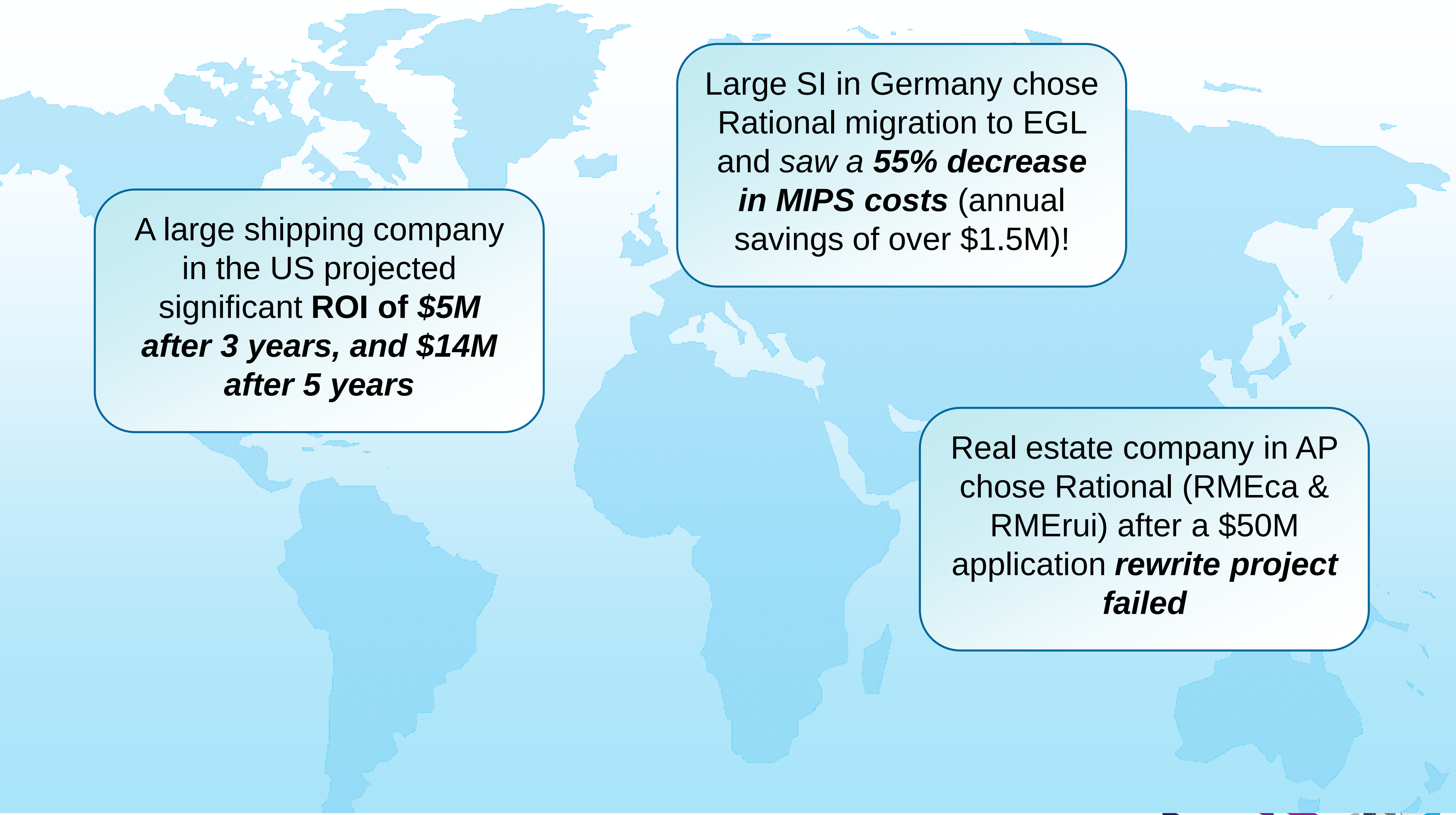
Data not easily accessible



Costs out of control



Why Rational Migration Extension

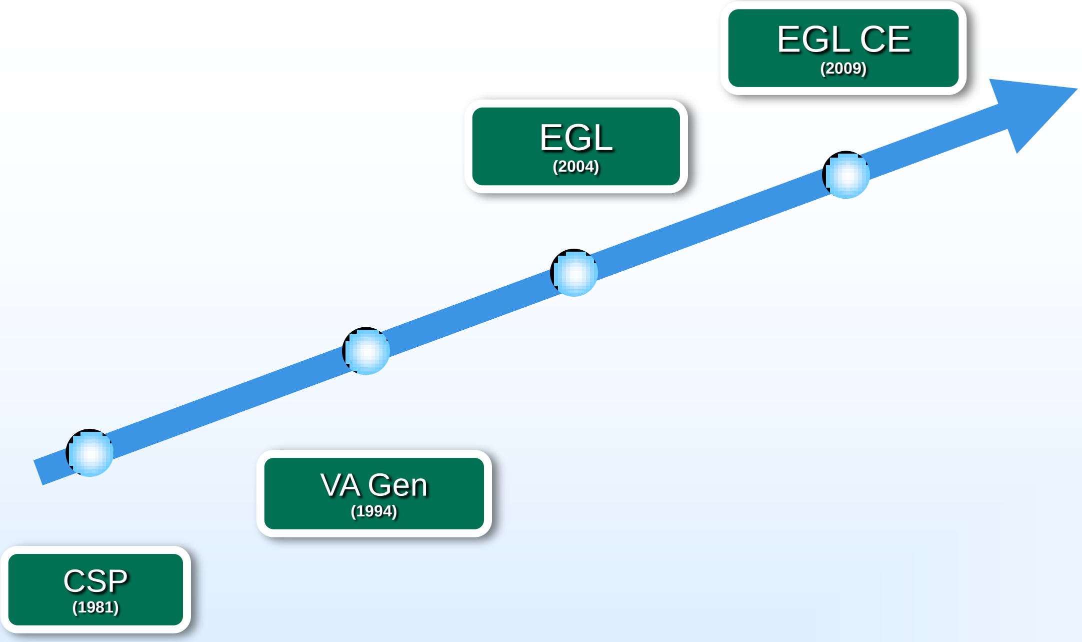


A large shipping company in the US projected significant **ROI of *$5M after 3 years, and $14M after 5 years***

Large SI in Germany chose Rational migration to EGL and *saw a* ***55% decrease in MIPS costs*** (annual savings of over $1.5M)!

Real estate company in AP chose Rational (RMEca & RMErui) after a $50M application ***rewrite project failed***

EGL: 30 years of innovation and investment



EGL to date …

- ✓ Represents 30 years of innovation and continued investment by IBM
- ✓ Introduced in 2004 as the follow on to CSP and VisualAge Generator
  - ✓ Designed for extensibility
- ✓ Thousands of customers using EGL and predecessor technologies
- ✓ Migration paths have preserved customers’ investments

What we have heard …

We prefer open languages because they are less risky to our business

We believe innovation is accelerated by giving others the ability to participate

We want to see an active community promoting awareness and growing skills

OPEN
Announcing
Eclipse EGL
Development Tools Project
An evolution in business application development

Approved by Eclipse on August 25, 2010

ASIST LEADING APPLICATION DEVELOPMENT & INTEGRATION · CLEAR BLADE · FBD ASSOCIATES INC. · PKS BUILDING BRIDGES · SYNCHRONY SYSTEMS, INC · xact · IBM

- Open source project on Eclipse.org for the EGL language, compiler, source editing tools, debugger, and generators for Java and JavaScript
- Initial contribution based on technology in IBM Rational Business Developer
- Core EGL development by IBM and other participants in the open on Eclipse
- **Project launched June 7, 2010**

eclipse

Benefits of an open EGL …

Reduces risk

Jointly developed in the open at Eclipse.org

Source available under Eclipse Public License (EPL)

Accelerates innovation

Gives others (not just IBM) the ability to …

- Build tools that compliment the tools provided by IBM
- Extend deployment to new runtime platforms
- Add language extensions to support new concepts

Broadens awareness and community

Opens EGL to new audiences

Gives others the opportunity to be involved in the planning and development process

Tools and solutions from IBM

- Rational Business Developer
- Rational Developer for z with EGL
- Rational Developer for i for SOA
- Rational Migration Extensions

IBM tools provide support for WebSphere Application Server, development of EGL JSF and TUI applications, generation of COBOL, and more …

Read the project proposal:

www.eclipse.org/proposals/egl

Recent EGL Open Press

Dr. Dobb's Journal: *EGL Means Business*
InfoWorld: *IBM EGL business language moves to open source*
IBM Systems Magazine: *A Little EGL, a Little RPG and a Little PHP*
SDTimes: *IBM submits EGL project proposal to Eclipse*
CNews: *IBM Opens New Language for Business Applications*
IT Jungle: *Open Source EGL Means an RPG Generator Is Possible*

SD Times SOFTWARE DEVELOPMENT ON THE WEB

eWEEK

SystemiNetwork The Ultimate Resource for System i Pros

IT Jungle Survive • Adapt • Thrive

InfoWorld

Dr.Dobb's THE WORLD OF SOFTWARE DEVELOPMENT

Get started today!

Simplify development of Web 2.0 solutions **with EGL Community Edition**

Eclipse-based development environment

- Small download, simple install
- WYSIWYG visual editor
- Instant application previewing without deploying to a server
- Full debug support for client and server-side code

Rich Web user interfaces using Dojo

- Fully extensible architecture supports other popular JavaScript widget libraries

Build Java-based Web services without coding in Java

- Take advantage of EGL's powerful keywords for accessing data in most popular databases, including MySQL

Spend more time innovating and less time fighting with technology!

Download EGL Community Edition today!
http://**www.ibm.com**/software/rational/cafe/community/egl/ce

EGL Distance Learning **2010**

Learn EGL by taking IBM's no charge (**free**) education course!

Explore the emerging cross-platform rapid development technology from IBM that enables you to build Web, Web 2.0, and SOA solutions using EGL.

Discover how quickly you can learn EGL and build state-of-the-art applications, all without getting bogged down in the technical complexities of middleware and runtime platforms

Topics

Foundations of EGL

Web 2.0 development with EGL Rich UI

2010 Dates

- February 15
- March 29
- May 3
- June 21
- July 26
- September 13
- November 15

Up to 3 hours of instruction per day

3 to 5 hours of independent hands-on per day

EGL Café

Online community for EGL developers, partners, and clients

Discussion forums

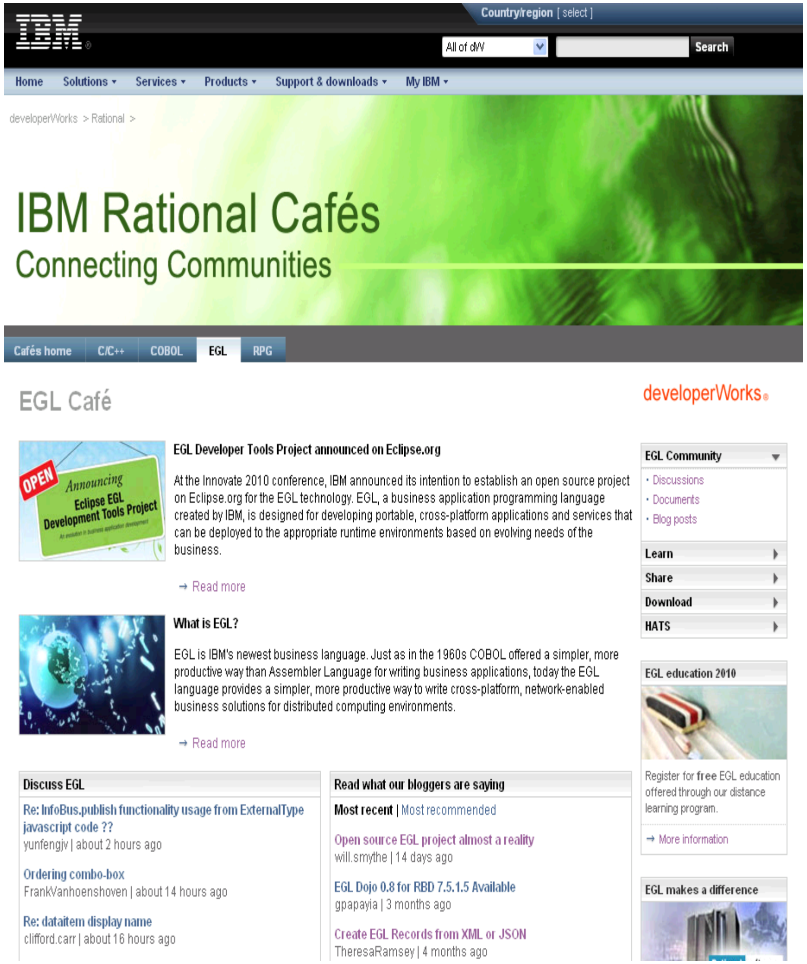
Gallery of sample applications and widgets

Presentations, videos, and articles

Blogs by IBMers and partners

Success stories

Become part of the community today!



EGL Café

EGL Developer Tools Project announced on Eclipse.org

At the Innovate 2010 conference, IBM announced its intention to establish an open source project on Eclipse.org for the EGL technology. EGL, a business application programming language created by IBM, is designed for developing portable, cross-platform applications and services that can be deployed to the appropriate runtime environments based on evolving needs of the business.

→ Read more

What is EGL?

EGL is IBM's newest business language. Just as in the 1960s COBOL offered a simpler, more productive way than Assembler Language for writing business applications, today the EGL language provides a simpler, more productive way to write cross-platform, network-enabled business solutions for distributed computing environments.

→ Read more

Discuss EGL

Re: InfoBus.publish functionality usage from ExternalType javascript code ??
yunfengjv | about 2 hours ago

Ordering combo-box
FrankVanhoenshoven | about 14 hours ago

Re: dataitem display name
clifford.carr | about 16 hours ago

Read what our bloggers are saying

Most recent | Most recommended

Open source EGL project almost a reality
will.smythe | 14 days ago

EGL Dojo 0.8 for RBD 7.5.1.5 Available
gpapayia | 3 months ago

Create EGL Records from XML or JSON
TheresaRamsey | 4 months ago

EGL education 2010

Register for free EGL education offered through our distance learning program.

→ More information

EGL makes a difference

Resources: Download, Learn, Presentations, Video/viewlet, Sample Code
Community: Clients, Partners, Influencers, Press, News and Events
Collaboration: Blogs, Forums, Tips and Techniques Comments, Ratings
Testimonials: Case Studies, Celebrations!

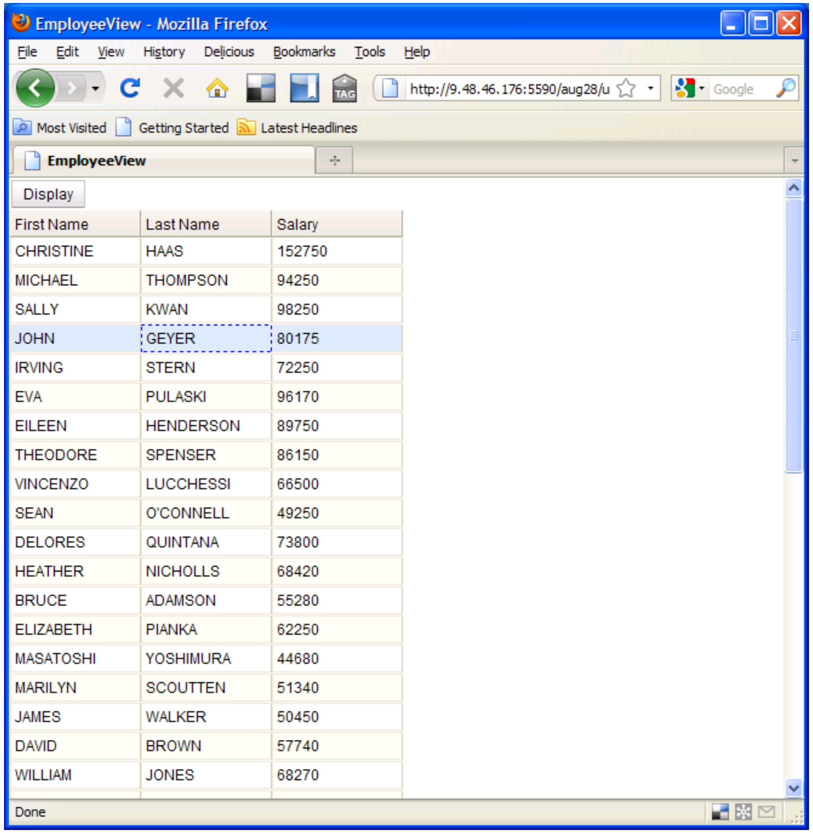
http://ibm.com/rational/eglcafe

Questions

www.ibm/software/rational

EGL Rich UI Database Example

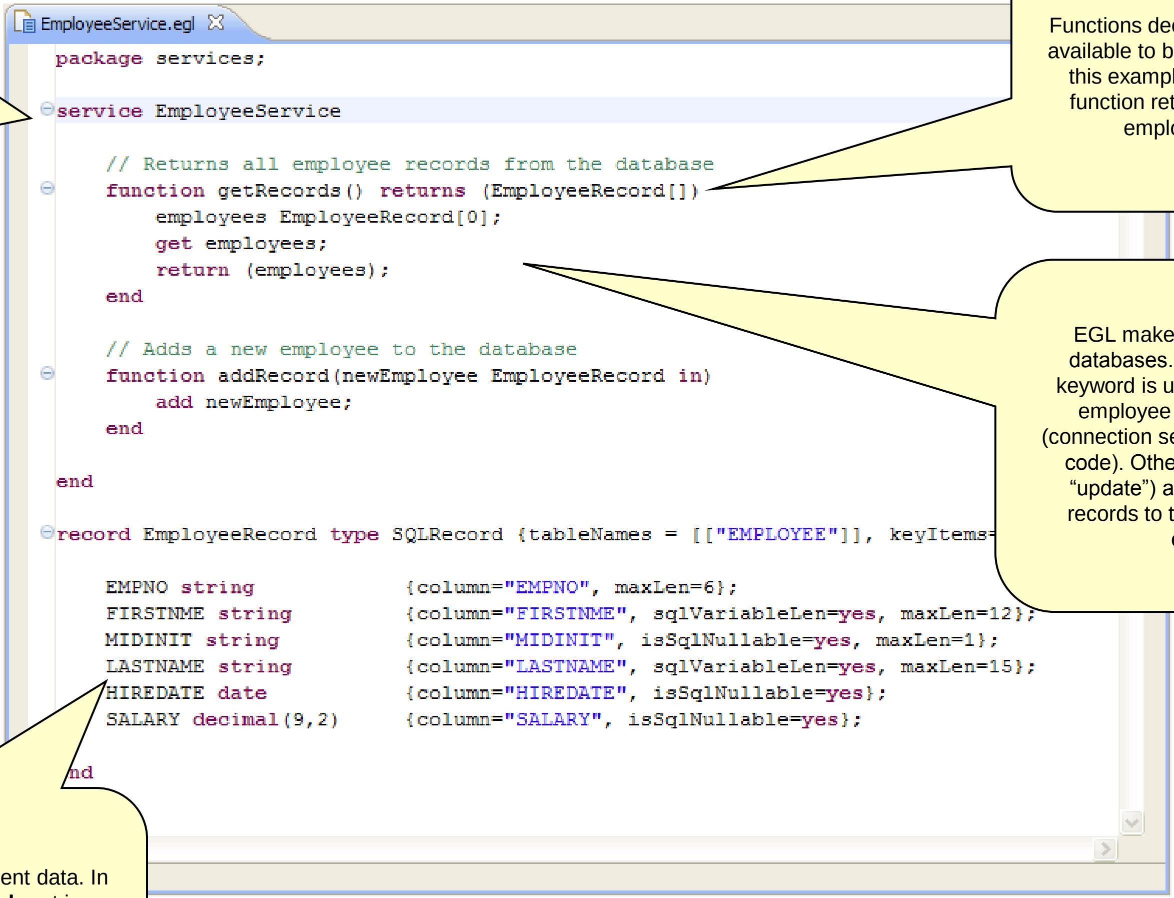
Objective: create a simple Web 2.0 style application to display data from a database in a Dojo grid.



First Name	Last Name	Salary
CHRISTINE	HAAS	152750
MICHAEL	THOMPSON	94250
SALLY	KWAN	98250
JOHN	GEYER	80175
IRVING	STERN	72250
EVA	PULASKI	96170
EILEEN	HENDERSON	89750
THEODORE	SPENSER	86150
VINCENZO	LUCCHESSI	66500
SEAN	O'CONNELL	49250
DELORES	QUINTANA	73800
HEATHER	NICHOLLS	68420
BRUCE	ADAMSON	55280
ELIZABETH	PIANKA	62250
MASATOSHI	YOSHIMURA	44680
MARILYN	SCOUTTEN	51340
JAMES	WALKER	50450
DAVID	BROWN	57740
WILLIAM	JONES	68270

EGL Rich UI Example (Server Side)

EGL has a **service** keyword that enables developers to define services, which are then compiled into Java and deployed as a REST or SOAP service.



EmployeeService.egl

```
package services;

service EmployeeService

    // Returns all employee records from the database
    function getRecords() returns (EmployeeRecord[])
        employees EmployeeRecord[0];
        get employees;
        return (employees);
    end

    // Adds a new employee to the database
    function addRecord(newEmployee EmployeeRecord in)
        add newEmployee;
    end

end

record EmployeeRecord type SQLRecord {tableNames = [["EMPLOYEE"]], keyItems=

    EMPNO string            {column="EMPNO", maxLen=6};
    FIRSTNME string         {column="FIRSTNME", sqlVariableLen=yes, maxLen=12};
    MIDINIT string          {column="MIDINIT", isSqlNullable=yes, maxLen=1};
    LASTNAME string         {column="LASTNAME", sqlVariableLen=yes, maxLen=15};
    HIREDATE date           {column="HIREDATE", isSqlNullable=yes};
    SALARY decimal(9,2)     {column="SALARY", isSqlNullable=yes};

nd
```

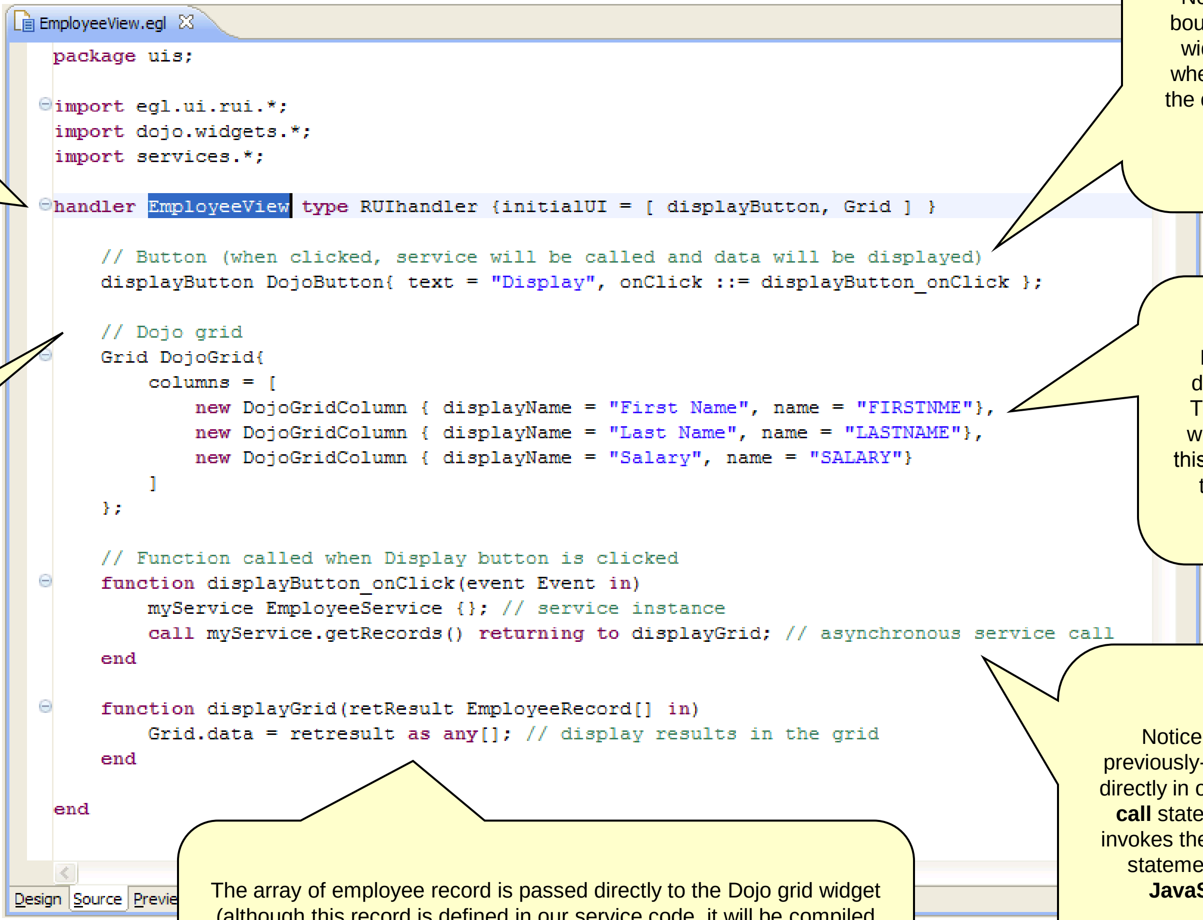
Functions declared in services are available to be called externally. In this example, the **getRecords** function returns an array of all employee records.

EGL makes it simple to interact with databases. In this example, the “**get**” keyword is used to populate an array of employee records from a database (connection settings are stored outside the code). Other keywords (like “add” and “update”) are used to easily add new records to the database or update an existing record.

Records are EGL parts that represent data. In this example, the **EmployeeRecord** part is an SQL record, which means it is tied to a table (or tables) in a database. As you can see, the table name is specified and fields within the record are bound to columns in the table.

EGL Rich UI Database Example (Browser Side)

The user interface is written completely in EGL (not HTML). This **code is compiled into JavaScript and HTML** on-the-fly during development.



```
package uis;

import egl.ui.rui.*;
import dojo.widgets.*;
import services.*;

handler EmployeeView type RUIhandler {initialUI = [ displayButton, Grid ] }

    // Button (when clicked, service will be called and data will be displayed)
    displayButton DojoButton{ text = "Display", onClick ::= displayButton_onClick };

    // Dojo grid
    Grid DojoGrid{
        columns = [
            new DojoGridColumn { displayName = "First Name", name = "FIRSTNME"},
            new DojoGridColumn { displayName = "Last Name", name = "LASTNAME"},
            new DojoGridColumn { displayName = "Salary", name = "SALARY"}
        ]
    };

    // Function called when Display button is clicked
    function displayButton_onClick(event Event in)
        myService EmployeeService {}; // service instance
        call myService.getRecords() returning to displayGrid; // asynchronous service call
    end

    function displayGrid(retResult EmployeeRecord[] in)
        Grid.data = retresult as any[]; // display results in the grid
    end

end
```

Notice how functions are bound to event types on UI widgets. In this example, when this button is clicked, the **displayButton_onClick** function is called.

Notice how columns are declared on the Dojo grid. The "name" field tells EGL which field in the record (in this case, "EmployeeRecord") to display in the column.

EGL uses a **declarative programming** style to make creating new objects (in this case, UI widgets) easy. In this example, a simple button and Dojo grid are defined.

Notice how an instance of the previously-created service is declared directly in our UI code. Also, notice the **call** statement that asynchronously invokes the **getRecords** method. This statement will be compiled into a **JavaScript Ajax** statement.

The array of employee record is passed directly to the Dojo grid widget (although this record is defined in our service code, it will be compiled into JavaScript since it is referenced by the UI code). The grid widget will automatically populate the grid based on the columns defined earlier and the data in the records.

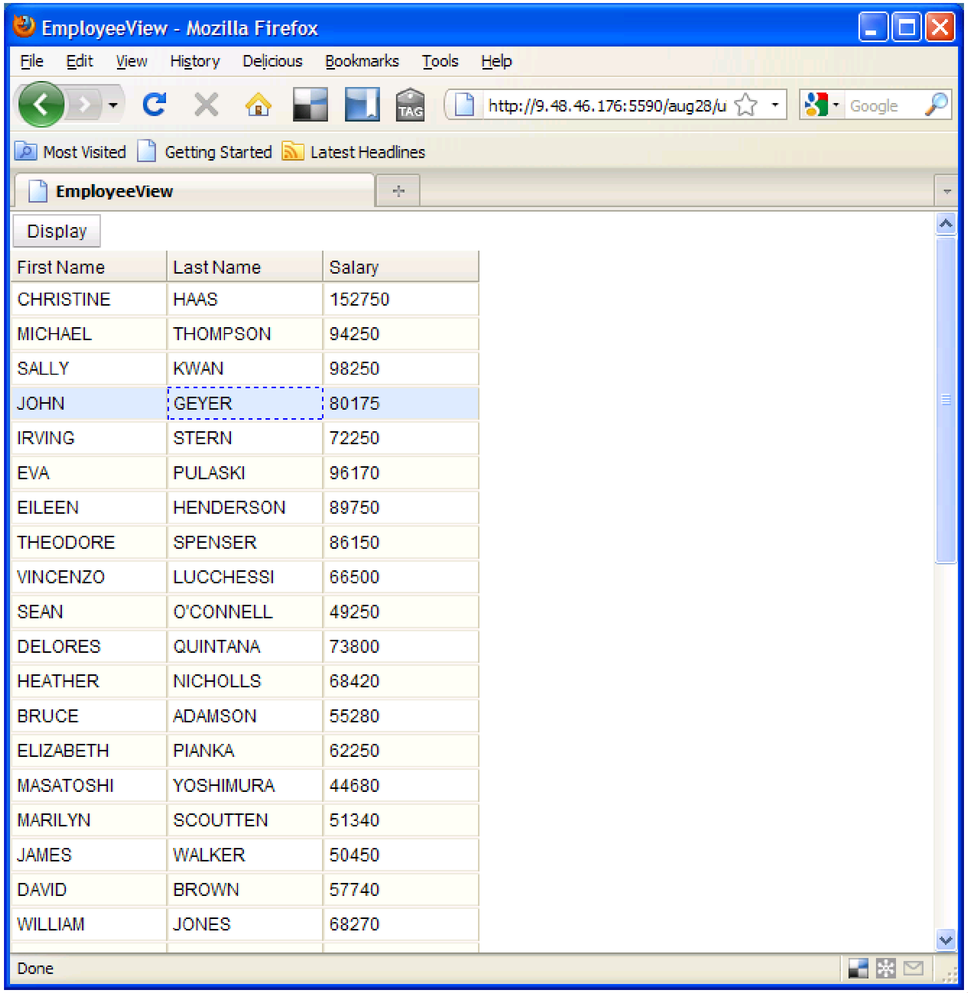
EGL Rich UI Database Example (End Result)

Clicking the Display button will cause a Web service to be invoked on the server. This service will pull records out of a database table and return them to the client. Once returned, the records will be displayed in the Dojo grid.

Key points:

- Data can be represented the same way in both server and client code.
- Web services can be easily created and invoked from the client side.
- EGL makes it simple to interact with a database.
- EGL does not replace HTML or JavaScript!

EGL allows you to **spend more time innovating and less time fighting with technology!**



First Name	Last Name	Salary
CHRISTINE	HAAS	152750
MICHAEL	THOMPSON	94250
SALLY	KWAN	98250
JOHN	GEYER	80175
IRVING	STERN	72250
EVA	PULASKI	96170
EILEEN	HENDERSON	89750
THEODORE	SPENSER	86150
VINCENZO	LUCCHESSI	66500
SEAN	O'CONNELL	49250
DELORES	QUINTANA	73800
HEATHER	NICHOLLS	68420
BRUCE	ADAMSON	55280
ELIZABETH	PIANKA	62250
MASATOSHI	YOSHIMURA	44680
MARILYN	SCOUTTEN	51340
JAMES	WALKER	50450
DAVID	BROWN	57740
WILLIAM	JONES	68270

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