Customizing a Packaged Application for a J2EE Environment: A Case Study

Leslie Tierstein

TopTier Consulting, Inc.

Overview (1)

- Learning experiences in a J2EE Environment
  - The environment
  - Deployment of a database-independent application
  - Identity management
  - Interfaces to external systems
    - Transport protocols
    - Message formatting

Overview (2)

- Learning experiences in a J2EE Environment
  - Customizing the user interface
    - Cascading Style Sheets
    - Internationalizing/nationalizing text strings
    - Web programming (HTML, JavaScript, JavaServer Pages)
  - Java and Javascript programming

Deployment Environment

- Four logical tiers:
  - Database server (SQLServer, Oracle, UDB/DB2)
  - Application server (WebLogic, WebSphere, JBoss)
  - Web server (Apache, IHS, IIS)
  - Browser (IE, Firefox)
- How many physical tiers?
- How many different combinations of hardware and software?

Deployment Options (1)

- Web server – software and hardware (OS)
  - IHS = IBM HTTP Server
  - Number of deployments as of June 2006

Apache	Linux	1	The open source solution
Apache	Solaris	2	
IHS	AIX	6	The IBM solution
IHS	Solaris	2	
IHS	Windows	3	
IIS	Windows	10	The Windows solution

Deployment Options (2)

- Application server – software and hardware

WebLogic	Linux	1	Which is “open source”?
WebLogic	Solaris	2	
WebSphere	Solaris	3	
WebSphere	AIX	6	IBM solution
WebSphere	Windows	4	
JBoss	Windows	7	Windows/J2EE solution
WebLogic	Windows	1	

Deployment Options (3)

- Database server – software and hardware (OS)

Oracle	Linux	1
Oracle	Solaris	6
Oracle	AIX	4
Oracle	HP-UX	1
SQLServer	Windows	11
Oracle	Windows	1

Database Deployment (1)

- Connection to the database is via JDBC
- The J2EE application server requires definition of data sources
  - Other applications (Cold Fusion) require (redundant) definition of the same data sources

Database Deployment (2)

- Database-Independence?
  - Really multiple versions of DDL
  - Need a tool that generates database-specific code from database-agnostic metadata
  - Compromises
    - Maintainability
    - Performance

Application Server Deployment

- WebSphere vs WebLogic vs Jboss
  - WebSphere and WebLogic are enterprise solutions
  - JBoss is a application solution
- Configuration issues
  - Adjustment of out-of-the-box parameters
- Deployment complexity

Identity Management

- Fat-Client Oracle-Based Identity Management
  - Each user assigned a database login
  - Authentication handled by the database
  - Authorization handled by a combination of database roles, application-specific user tables, and application code
  - Persistent sessions allow use of package variables

Identity Management

- Thin-Client Web-Based Identity Management
  - All users connect to the application's database via the same database login
  - Application-specific database tables store additional information for authenticating the user and authorizing access to various parts of the
  - Web session variables, cookies, or other mechanisms track the user through non-persistent sessions

Identity Management

- LDAP-Based Identity Management
  - Authentication information in a Lightweight Directory Access Protocol (LDAP) Directory
    - MS Active Directory, Oblix (acquired by Oracle)
    - OpenLDAP, IBM Tivoli Access Manager (TAM)
    - Others
  - One integration point is Single Signon (SSO)
  - Other integration points may provide user lookup/selection and authorization
  - May be used in conjunction with application-specific authorization tables

External Interfaces

- Transport protocols
  - File: via polling
  - Database: JDBC compliant
  - Java Message Services (JMS)
  - IBM MQ Series queues
  - HTTP -- Web services via SOAP
    - Still more talked about than practical
- Proprietary interfaces
  - HP OpenView API
  - Sockets

Web Services

- Security issues need to be addressed
  - Service-specific certificates
- Interface to other customizable packages
  - BMC Remedy Help Desk
  - Published WSDL

External Interfaces

- Message content - custom XML dialect
- Message transformation - XSL

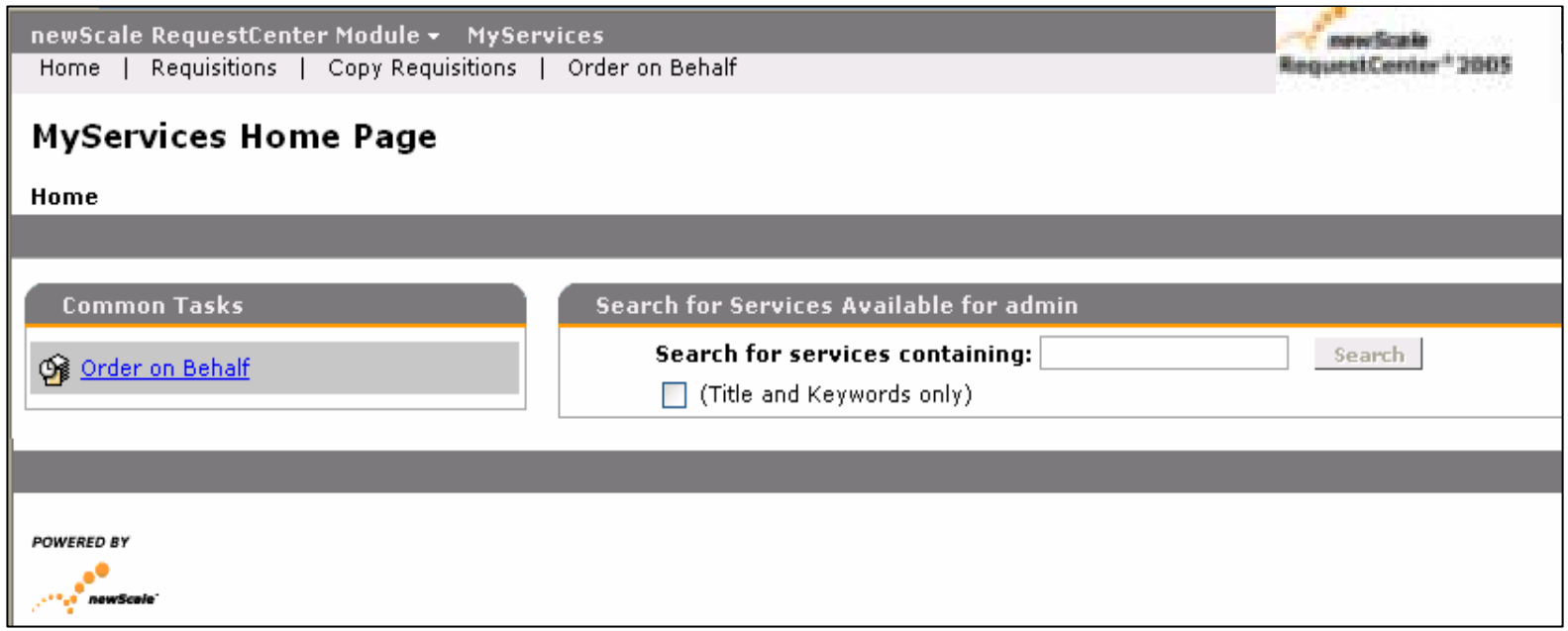
General Properties

▸ **Name**	Survey Outbound Transform	**Description**
▸ **Direction**	Outbound (used in one agent)	
Created On	03/02/2006	**Created By**
Last Updated On	03/02/2006	**Last Updated By**

```
<xsl:stylesheet version="1.0"
                xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns="http://www.w3.org/TR/xhtml1/strict">
<xsl:template match="/">
<ClosingTicketDetailsDS>
<ClosingTicketDetailsTable>
  <RCTaskID><xsl:value-of select="/message/task-started/task/task-id"/></RCTa
  <RCRequisitionID><xsl:value-of select="/message/task-started/requisition/re
  <RCRequisitionEntryID><xsl:value-of select="/message/task-started/requisiti
```

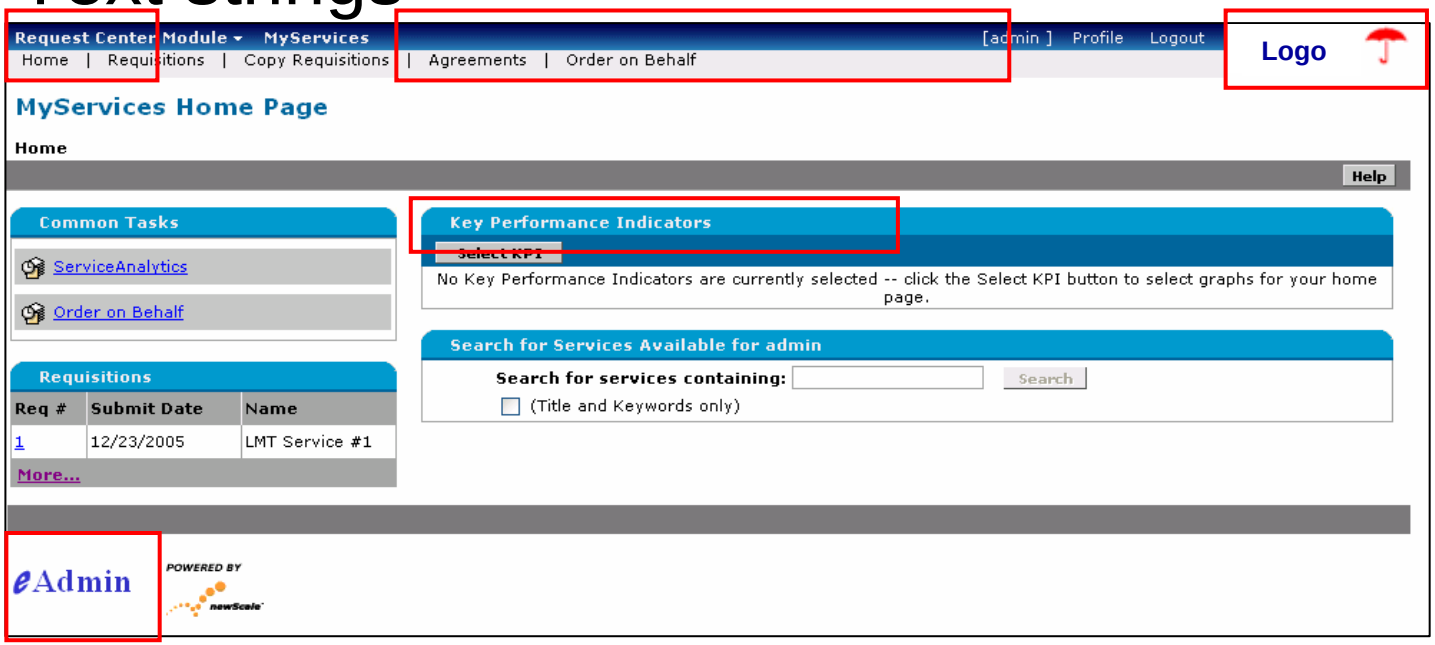
Out-of-the-Box User Interface

- Logo and branding (top-right and bottom-left)
- (Lack of) color scheme



Customized User Interface

- Logo and branding (top-right and bottom-left)
- Color scheme
- Text strings



Customized User Interface

- Cascading Style Sheets
  - Allow appearance of the web pages to be changed without having access to source code
  - Requires knowledge of CSS syntax and capabilities
  - Requires knowledge of HTML: classes, id's, elements and their attributes
  - Requires knowledge of the HTML used in the application

Customized User Interface

- Cascading Style Sheets
  - Style Sheet

```
/** Header class provides the branding logo at top-
    right of the page.*/
#header
{
  background:  #ffffff url(/TopTier/images/mylogo.jpg)
…;
}
```

Customized User Interface

- Cascading Style Sheets
  - Application Page HTML

```
<div id="header">
  <div id="nav">
    <span class=“scmenu"
          onclick="processmenu(event);">
      TopTier Services Module
    </span>
```

Customized User Interface

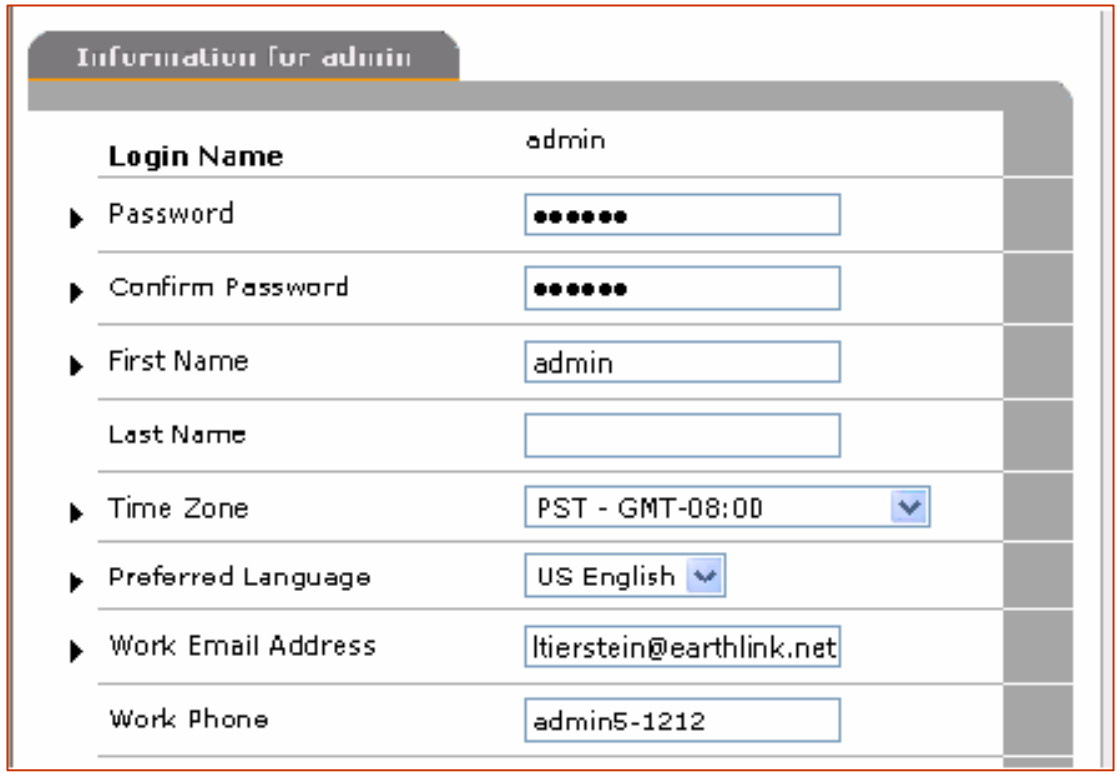
- Customizing text of strings
  - No strings hard-coded in the application
  - All text strings stored in locale-dependent resource bundles (using the Java Resource Bundle coding guidelines)
  - Also need the ability to edit particular strings to user requirements

Customized User Interface

- Sometimes, users just wanted a change that couldn’t be accommodated via customization tools
- Changes to source were required
  - JavaServer Pages
  - Cold Fusion! (being phased out)
- Use of the product’s customization framework
  - JavaScript for Interactive Service Forms (ISF)

Working with JSPs

- The page as displayed by the application



Working with JSPs

- The JSP source code
  - Use of JSTL and custom tags

```
<table class="formTable" width="100%" cellpadding="0" cellspacing="0">
  <tr>
    <td class="formReq"></td>
    <td class="formLabel">
      <label for="formItem1"><ns:DisplayString key="common.person.loginname"/>
    </td>
    <td class="formElement">
      <c:out value="${personprofileform.loginName}"/>
            <input type="hidden" name="loginName"
            value="<c:out value='${personprofileform.loginName}'/>">
    </td>
```

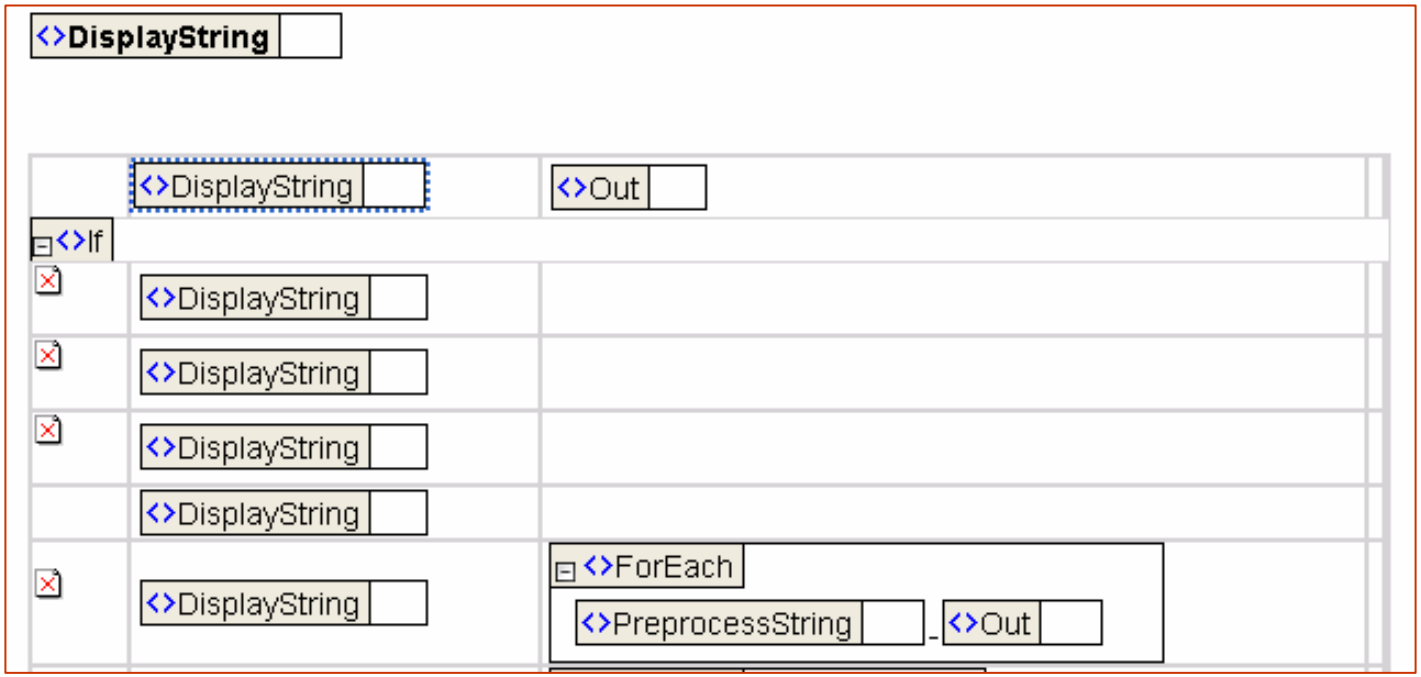
Working with JSPs

- The generated HTML

```
 <table class="formTable" width="100%"
cellpadding="0" cellspacing="0">
  <tr>
 <td class="formReq"></td>
 <td class="formLabel">
  <label for="formItem1">Login Name</label>
 </td>
 . . .
```

Working with JSPs

- JDeveloper's Design View
  - JSP Tags are displayed



Java 101

- Textbooks, including books on Java Certification, includes lots that's not relevant and are missing lots that is relevant
- Missing, easy-to-acquire knowledge
  - Thinking in Java, object-orientation (it's in PL/SQL now, too)
- Missing, harder-to-acquire knowledge
  - Java methods and objects
  - Java terminology and mindset
    - Design patterns

JavaScript 101

- The technology that “can’t get no respect”
  - Perhaps AJAX will help to change this
- Debugging can be difficult
- Browser wars still alive and well
- Document Object Model (DOM) is critical for advanced functionality

Conclusion

- Have you been counting the technologies/skills?

Java	XML	HTML
JavaScript	XSLT	JSTL
JavaServer Pages	SQL	LDAP
Cold Fusion	CSS	SSO
JDBC	SOA	WSDL

About the Author

- Leslie Tierstein is a Principal Technical Architect at a Silicon Valley company which produces a software package for Service Catalog Management
- She has delivered presentations many Oracle user groups and has been the technical editor for several books published by Oracle Press
- She can be reached at ltierstein@earthlink.net
- Her website is http://home.earthlink.net/~ltierstein