



# Next Generation Portal Technologies

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# What is a Portal?

*“The portal, one of many new concepts that have emerged from the Internet, allows a school or college to provide its students and staff with highly tailored windows into the Internet and to the applications to which the school subscribes. This focused and personalized screen greatly simplifies use of the computing network by enabling the user to navigate quickly to the information or application needed.”*



The screenshot shows the Jetspeed website, which is a portal for Apache users. It features a search bar, navigation links, and various news articles and links. The page is titled "Welcome to Jetspeed" and includes a "Server date" of "10-10-2001". The main content area is divided into several sections, including "Example Cocoon portlet", "Search", "Apache Week", "Apache.org defaced", "win the news: 2001 benchmarks Apache", "win the news: 4-3rd April 2001 survey", "Application", "Checked licenses", "Feedback", "What's new", "Who's schema editor", "System instances", "Edit or form", "Extensibility", "Availability has released", "The Apache web site was defaced", "win the news: 2001 benchmarks Apache", "win the news: 4-3rd April 2001 survey", "Last week, Sun released", "A shell tool to add your", "IBM WebSphere Portal Server", "Welcome to WPS", "Demo: Weather", "Demo: Stocks (USD)", "World Politics", "Recruiting This Week", "Resource availability", "6-Month Forecasting trend", "Revenue", "Job Postings for My Review", "Calendar", and "September 2001".



The screenshot shows the Yahoo! My Front Page portal. It displays a personalized interface with sections for "Sign in to Yahoo!", "My Front Page Headlines", "Yahoo! Search", "Bookmarks", and "Portfolios". The page is titled "Welcome to My Yahoo!" and includes a "Server date" of "10-10-2001". The main content area is divided into several sections, including "Sign in to Yahoo!", "My Front Page Headlines", "Yahoo! Search", "Bookmarks", and "Portfolios".



The screenshot shows the AVITEK Staffing website, which is a portal for information sharing. It features a search bar, navigation links, and various charts and data tables. The page is titled "AVITEK Staffing" and includes a "Server date" of "10-10-2001". The main content area is divided into several sections, including "Recruiting This Week", "Resource availability", "6-Month Forecasting trend", "Revenue", "Job Postings for My Review", "Calendar", and "September 2001".

# Quotable Quotes

*“Enterprise portals offer one-stop shopping for knowledge workers...”*

*“A Web page that serves as a point of entry for surfers of the World Wide Web. ... Many portals also offer value-added services such as e-mail accounts, Web page hosting, or filtered information flow...”*

*“The clunky intranet has given way to sophisticated corporate portals, and analysts predict these portals may soon become the new metaphor for desktop computing in business.”*

*“At the most basic level, a portal is a web site targeted at a specific audience that provides:*

- *Content aggregation and delivery of information relevant to the audience*
- *Collaboration and community services*
- *Services and applications access for the target audience, delivered in a highly personalized manner”*

*“Anyone, Anytime, Anywhere Learning, on Any Device”*

*“As companies have grown over time, they’ve resorted to storing data in all sorts of formats...Portals strive to make all those data types accessible to the portal’s main servers no matter the manner in which the data is coded.”*





# What are the Problems?

## n Diverse

- | sources of data
- | types of data
- | access mechanisms
- | security mechanisms

## n Desires

- | reduce costs
- | make best use of available, often outdated hardware
- | personalisation

## n Needs

- | re-task legacy data
- | impose workflows



# Problems Solved!

n Portals!

n Can give us

l single-sign-on

n no more need for the memory of an elephant just to help recall lists of passwords!



l a unified user interface

n easy of use

n efficiency

l simplified/tailored workflow

n vital for 'unsophisticated' users

l very few people can be sophisticated users across a range of systems

l cost savings

n eventually!

n infrastructure is always hard to quantify/justify



# Spectrum of Solutions

## n Many axes

- ┆ cost, time, scalability, security interoperability, ease of use, etc.

## n Many technologies

- ┆ LAMP, J2EE, SOAP, etc.
- ┆ .NET to come

## n Many vendors

- ┆ Sun, Novell, Microsoft, etc.
- ┆ Open Source solutions

## n It's all *very confusing!*



# Architecture Similarities

n All tools share the same basics

- | portlets/gadgets/filters/gizmos...
- | layouts/visuals
  - n boxes, skins, layouts, styles, swim lanes, etc.
- | composition
- | customisation/personalisation
- | profiles



## Stock Portfolio

Enter your symbols separated by commas:

## Stock Portfolio

Symbol	Price	Change	Volume
SUNW	8.67	-0.26	94976000
IBM	105.90	+2.88	10767700
ORCL	13.67	-2.32	208718704
CSCO	16.48	+1.48	93038200



# Typical Features

- n Portal systems typically provide:
  - syndicated content
  - HTML front ends to internal applications
  - e-Mail and/or calendar server/client
  - integrated remote document access
  - integrated printing
  - access to X11 and Microsoft Windows applications
    - n via X emulation/Citrix





# LAMP

## n Linux, Apache, MySQL, P\*

### l Open Source languages/tools/etc.

n Linux: Free/Open Source Operating System

l *“free as in libre, not beer”*

n Apache: Open Source Web Server

n MySQL: Open Source relational database

n P\*: PERL, Python, PHP

l three ‘trendy’ programming/scripting languages

l low cost of entry (infrastructure), potentially offset by high development/maintenance costs





## More LAMP

- n A roll-your-own solution
  - l for the DIY aficionado
  - l may find many willing hands
    - n even among the student body!
    - n can keep costs down
- n Relatively light hardware requirements
- n Probably appropriate for light use/small number of users only
- n Can do much the same with 'straight' Microsoft/Java technologies, etc.

# LAMP Example

Not a Portal  
example *per-se*,  
but you get the  
flavour, I hope!

```
<html>
<head>Querying a database</head>
<body>
<?
$dbhost = "database.host.name";
$dbuser = "database.username";
$dbpw = "database.plaintext.password";
$dbName = "interesting_stuff";

mysql_connect($dbhost, $dbuser, $dbpw) or die("Unable to connect to host $dbhost");

mysql_select_db($dbName) or die("Unable to select database $dbName");

$result = mysql_query("SELECT inv.inventoryID, inv.dateAcquired,
                        emp.firstName, emp.lastName, comp.computerDescription
                        FROM inv, emp, comp
                        WHERE ((inv.employeeID = emp.employeeID)
                               and (inv.computerID = comp.computerID))
                        ORDER BY emp.lastName, emp.firstName");

$number = mysql_numrows($result);

print "<p>There are $number records in the inventory:</p>";
for ($i=0; $i<$number; $i++) {
    $lastName = mysql_result($result, $i, "lastName");
    $firstName = mysql_result($result, $i, "firstName");
    $computerDescription = mysql_result($result, $i, "computerDescription");
    $dateAcquired = mysql_result($result, $i, "dateAcquired");
    print "$lastName, $firstName, $computerDescription, $dateAcquired<br />";
}

mysql_close();
?>
</body>
</html>
```





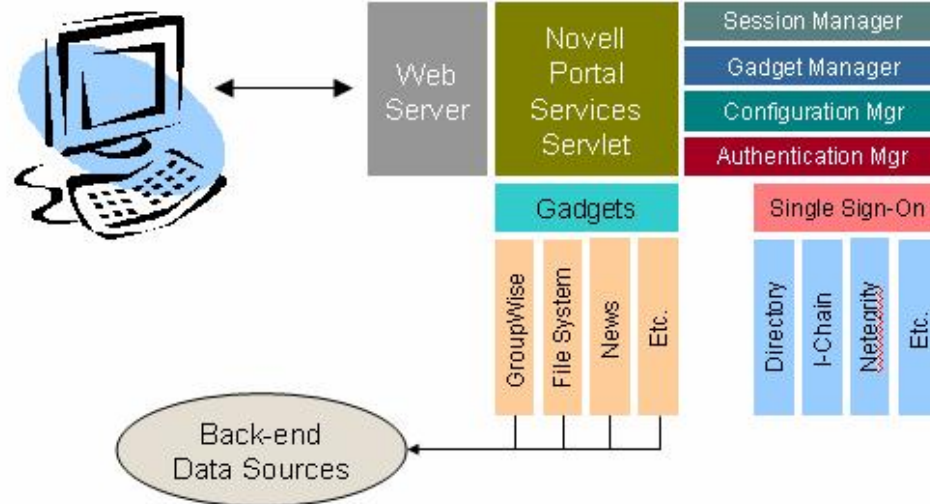
# Novell Portal Services

- n A 'no-brainer' for those sites that are heavily Novell-oriented



## High Level Design

[www.novell.com](http://www.novell.com)



1/25/2001

Copyright 2001, Novell Inc.

**Novell.**

slide taken from Novell's website



# NPS...

- n Servlets ('gadgets') that represent a small area on the screen showing the most important information from applications or web data
  - n Gadgets can link to anywhere on the web
  - n The administrator determines when, where, and how a gadget is viewed
- n Example gadgets
    - | Stock ticker
    - | News - headlines
    - | IMAP
    - | Weather
    - | File access
    - | Portal statistics
    - | Citrix
    - | Personalize
    - | GroupWise
    - | Exchange
    - | Html
    - | Shortcut
    - | Self-registration

# NPS...

## n Gadgets

- | enhance Java Servlets
- | Live in a Servlet engine such as Tomcat
- | are configured using XML
- | generate XML data
- | use XSLT to render generated XML to HTML
- | can talk to practically any back-end source
- | are packaged and deployed into NPS using an Admin gadget
  - n developer's SDK also includes a GadgetRunner tool





# NPS...

```
import ...;
```

```
public class HelloWorld extends com.novell.nps.gadgetManager.BaseGadgetInstance
{
    private static final String HELLOWORLD_TAG = "HelloWorld";
    private static final String HELLODATA_TAG = "HELLODATA";
```

```
    public void getData(HttpServletRequest req, BufferedWriter out,
                        Document domTree)
```

```
    throws GadgetInstanceException
```

```
    {
        try
```

```
        {
            XmlUtil.writeStartTag(HELLOWORLD_TAG, out);
            XmlUtil.writeTag(HELLODATA_TAG, "Hello World!", out);
            XmlUtil.writeEndTag(HELLOWORLD_TAG, out);
        }
```

```
        catch(IOException io)
```

```
        {
            throw new GadgetInstanceException("I/O Error");
        }
    }
```

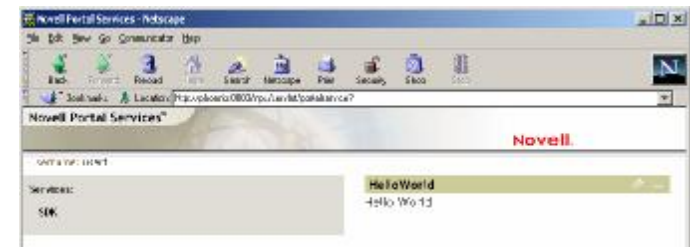
```
}
```

```
    k    <HelloWorld>
        <HELLODATA>Hello World!</HELLODATA>
    </HelloWorld>
```

```
<xsl:stylesheet version="1.0"
    xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
```

```
l    <xsl:template match="HelloWorld">
        <xsl:value-of select='HELLODATA' />
    </xsl:template>
</xsl:stylesheet>
```

m



# J2EE

- n Java 2, Enterprise Edition
- n High-end 'enterprise' solution
  - | initially intended for amazon.com-style ventures
    - n becoming a more general tool
    - n still a little difficult to find hands/brains...
  - | infrastructure-oriented
    - n scalable, secure, transactional, clusterable, available 24x7, etc.
  - | not so pre-packaged
- n Vendor independent
  - | most big names involved: Sun, IBM, Oracle, BEA, HP, etc.
  - | can be \$0 or \$50,000, open source or mega-commercial
  - | NOT Microsoft...
- n Lays the foundation for personalisation/commerce systems
  - | very high-end frameworks
- n A fair bit of QLD adoption
  - | especially by the government



# More J2EE

- n Incorporates many technologies
  - | Servlets/Java Server Pages
  - | Enterprise Java Beans
  - | Java Naming and Directory Interface
  - | Java Connector Architecture
- n Emphasis on design
  - | UML tools, Model-View-Controller architecture, etc.
- n Emphasis on development lifecycle
  - | coding/testing/deployment, etc.
- n Heavy emphasis on tool support
  - | Forte/Netbeans, Webgain, JBuilder, etc.
  - | lots of open source hacking taking place



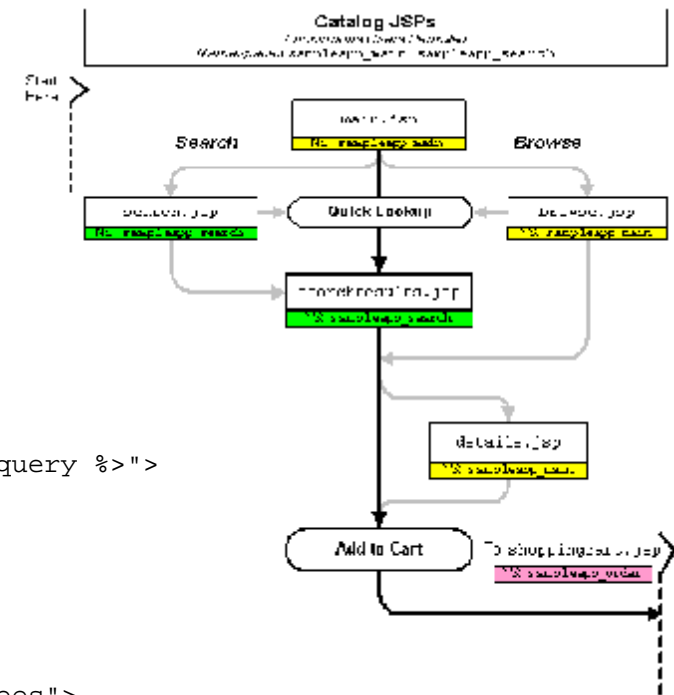


# J2EE Examples

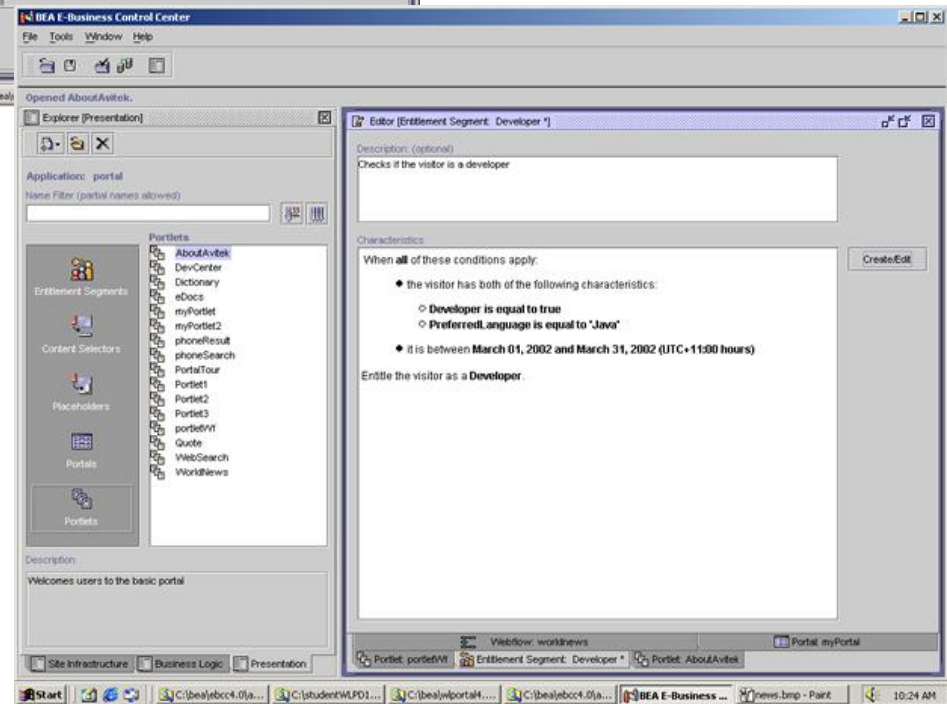
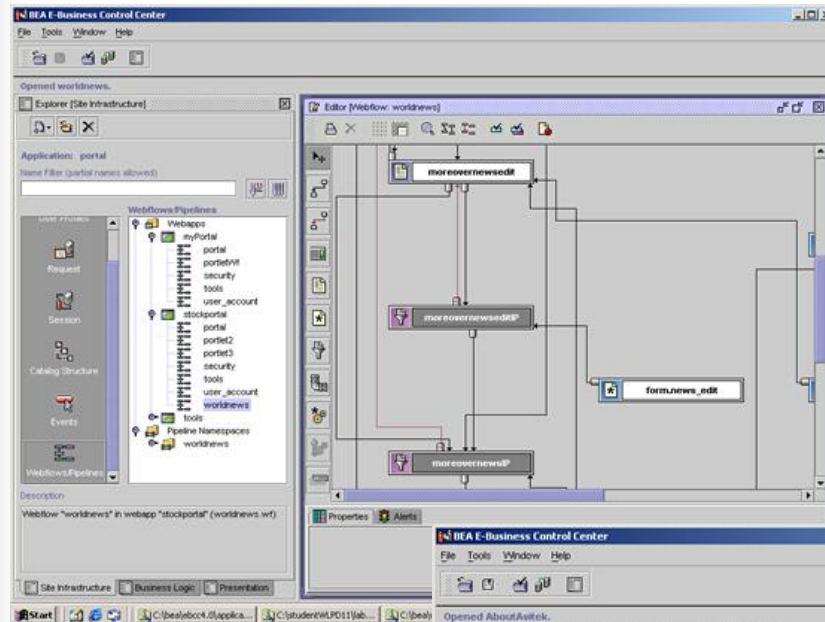
```

<%@ taglib uri="sql" prefix="sql" %>
<! String query = "SELECT * FROM emp"; %>
<html>
<head>
<title>Custom SQL JSP Tags</title>
</head>
<body>
<h1>Employee Database:</h1>
<sql:connection pool_name="demoPool">
<p>Making a query: <%= query %></p>
<sql:query id="employees" sql="<%= query %>">
<p>Here are the results...</p>
<table border="1">
<tr bgcolor="DDDDFF">
<th>Employee Name</th>
<th>Job Role</th>
</tr>
<sql:results from_query="employees">
<tr>
<td><%= employees.getString("ename") %></td>
<td><%= employees.getString("job") %></td>
</tr>
</sql:results>
</table>
</sql:query>
</sql:connection>
</body>
</html>

```



# Screenshots...



*BEA's Weblogic  
Portal Server 4.0  
"E-Business  
Control Center"*

# JetSpeed

- n The leading open source portal server
- n Portlets are specialized Java Servlets that plug into and run in portals
- n Designed to be aggregatable in the larger context of a portal page. They rely on the portal infrastructure to function.
- n Uses Portal Structure Markup Language to define page layout/contents/decorations, etc.
  - l JetSpeed provides a customiser/administrator tool to use during page assembly
- n Uses XML to define services

*“Jetspeed is full of promise, but the bad news is that you have to be brave right now to start using it. Recalling the "release early and often" mantra of open source, it's still quite early if you haven't got the time to get involved in the project.”*





# JetSpeed Example

```
package com.bluesunrise.portal.portlets;  
  
import ...;  
  
public class HelloUserPortlet extends AbstractPortlet  
{  
    public ConcreteElement getContent(RunData runData)  
    {  
        return (new StringElement("Hello World!"));  
    }  
}  
  
<?xml version="1.0" encoding="UTF-8"?>  
<registry>  
    <portlet-entry name="HelloWorld" hidden="false"  
        type="instance" application="false">  
        <meta-info>  
            <title>HelloWorld</title>  
            <description>Portlet How To Example</description>  
        </meta-info>  
        <classname>com.bluesunrise.portal.portlets.HelloWorldPortlet</classname>  
        <media-type ref="html" />  
    </portlet-entry>  
</registry>
```

Add Title	Description
<input type="checkbox"/> AdminInfo	Description not available
<input checked="" type="checkbox"/> Apache News from Apache Week	The essential resource for anyone running an Apache server or anyone responsible for running Apache based services
<input type="checkbox"/> Apacheweek	Description not available
<input type="checkbox"/> HelloJSP	Simple JSP Portlet Example
<input checked="" type="checkbox"/> HelloVelocity	Simple Velocity Portlet Example
<input checked="" type="checkbox"/> HelloWorld	Portlet How To Example 1 - Hello World
<input type="checkbox"/> JSP1_2andJetspeedTagLib	JSP Portlet Example that displays data from the Jetspeed Tag Libaray and Java Servlet request class
<input type="checkbox"/> JavaSoft	JavaSoft
<input type="checkbox"/> Jetspeed	Description not available
<input checked="" type="checkbox"/> Jetspeed	Jetspeed is a multi-device portal system with simple syndication capabilities
<input type="checkbox"/> JetspeedContent	Description not available
<input type="checkbox"/> Mozilla	Description not available
<input checked="" type="checkbox"/> Mozilla latest headlines	Here you will find notices of important changes to the web site or new information important to the Mozilla developer community For pointers to the hottest article and threads in our newsgroups check out NewsBot
<input type="checkbox"/> My Bookmarks	Insert your personal links!
<input type="checkbox"/> Search	Search the Internet

Apply Cancel [Next >>](#)

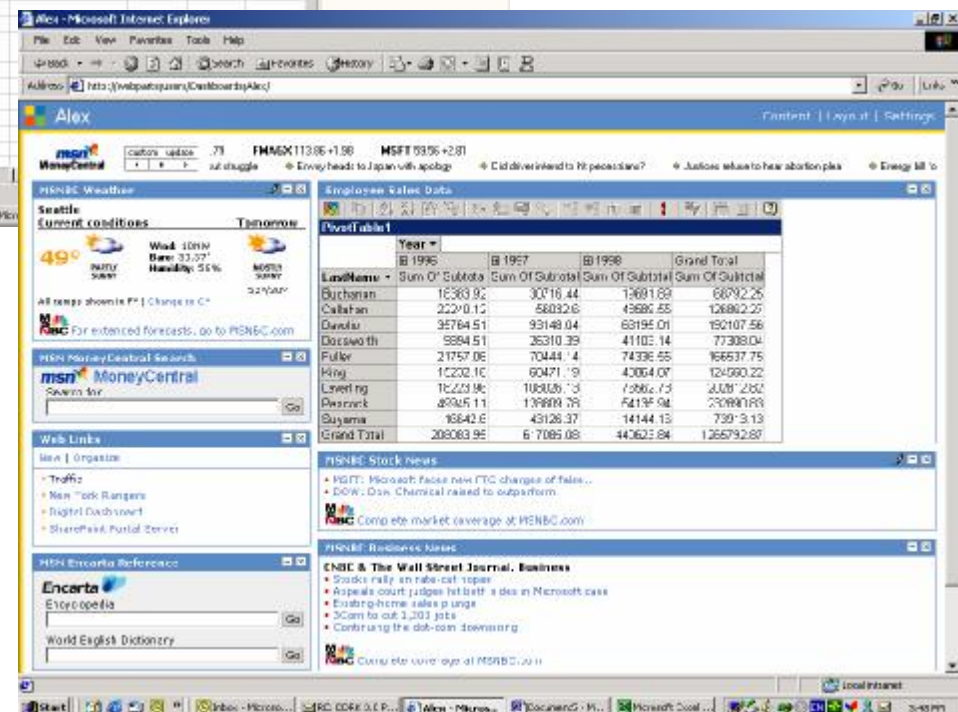
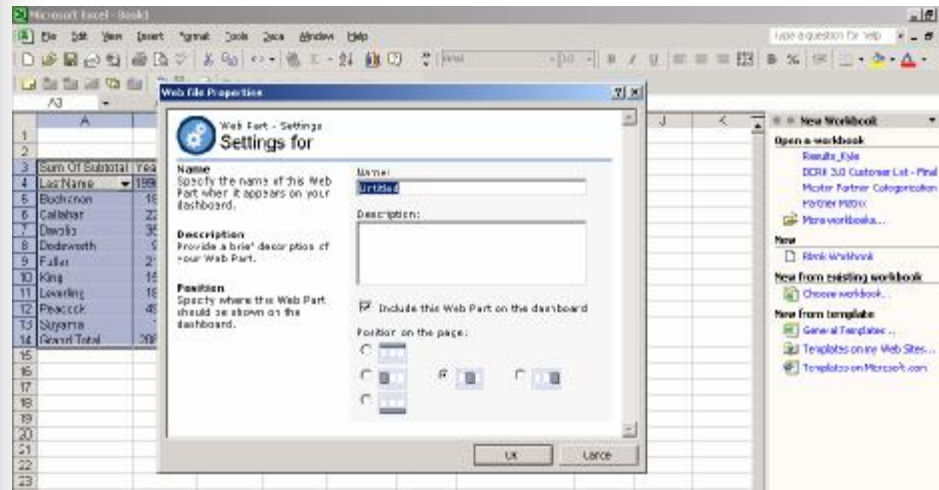
# Microsoft SharePoint Portal Server

- n Presents a collection of *digital dashboards*
- n A digital dashboard aggregates disparate pieces of information and services and presents them by using *web parts*
- n Web parts are reusable Web components that contain any kind of Web-based information
- n Heavily XML oriented
  - | also ADO/ASP...
- n Visual Studio allows development of dashboards and other site infrastructure
- n Office XP Developer is the primary tool for building web parts
  - | lots of pre-canned functionality available
    - n threaded discussions, etc.
  - | allows for easy publishing



# SPS...

*an Excel  
Pivottable being  
published as a  
portlet*





# JSR 168: Portlet Specification

- n Java Community Process Specification Requests
- n Portlets are web components specifically designed to be aggregated in the context of a composite page
  - | many Portlets are invoked in the single request of a Portal page, each produces a fragment of markup that is combined with the markup of other Portlets, all within the Portal page
- n First version has the following design goals:
  - | Client agnostic with support for multiple types of clients (multi-device)
  - | Simple Portlet API
  - | Support for Localization and Internationalization
  - | Hot deployment and re-deployment of Portal applications
  - | Declarative security
  - | support remote execution of Portlets



# Closing Thoughts

- n A lot is happening at the moment
  - ┆ a wide spectrum of choices
    - n choice is good (?!)
  - ┆ need to be careful that what looks good *now* will look good *later*
- n Portals offer promise
  - ┆ significant planning and development needed to use effectively
  - ┆ many educational institutions *are* implementing portals



# Thoughts: EduSPs

- n A popular idea (with vendors)
  - l offload a school's facilities and functions to third party vendors

*"Beware of portals you can't leave."*

*GIVEN HALF A chance these days, it seems that every major software vendor is willing to give any prospective customer a portal for free. The first thing the vendor thinks is "What can I appear to be giving away in order to get the account?" The first and most obvious answer they come up with is the portal.*

*The trouble with this apparent generosity is that once you accept an invitation to enter a portal you may never leave....once you standardize on their portal, you are practically locked into their platform for eternity.*

*Portals in general are a good idea, but the original purpose of this class of software is being perverted as the major enterprise software vendors try to make the portal the next great user interface war.*

...

*With that in mind, the best thing you can do the next time someone offers to bundle in a portal is just say no. They are trying to get you addicted to a user interface that will make your IT organization subservient to their middleware.*

...

*So by all means, go through that portal. Just make sure the key to the door stays firmly tucked away in your pocket."*

— Michael Vizard , Infoworld





# Resources

- n <http://www.campusportals.org>
- n <http://www.novell.com/products/portal>
- n <http://java.sun.com/j2ee>
- n <http://java.apache.org/jetspeed>
- n <http://jcp.org/jsr/detail/168.jsp>
- n <http://www.infoworld.com/articles/op/xml/02/02/25/020225opnoise.xml>
- n [http://www.computerworld.com/cwi/story/0,1199,NAV47\\_STO45471,00.html](http://www.computerworld.com/cwi/story/0,1199,NAV47_STO45471,00.html)
- n <http://www-106.ibm.com/developerworks/ibm/library/i-portal/>
- n <http://www.microsoft.com/sharepoint/portals/ever.asp>

