

Oracle Portal: A Roadmap For Success

Peter A. Brassington, MFG Systems Corporation

Background

Oracle Portal is Oracle's newest tool for building web-based applications and enterprise portals. The tool is the renamed and latest version of Oracle WebDB. It is housed entirely in the database and all development, administration and interaction is done via the browser.

While WebDB 2.X allowed developers to easily develop components such as forms, reports and charts, the development features were very limited. Oracle Portal has significantly enhanced the component building features available in WebDB. In addition to component building, WebDB included self-service web publishing via WebDB sites. The site building capabilities are also much improved in Oracle portal.

The major new feature in Oracle Portal is the ability to build, deploy and maintain self-service, integrated enterprise portals. Enterprise portals enable users to customize their view of the Internet and are conceptually similar to portals such as MyYahoo and MyNetscape.

Overview

Oracle Portal is a solution for building, deploying, and maintaining self-service enterprise portals. There are two basic options for displaying Oracle Portal Content.

1. Portal Pages consisting of portlets.
2. Sites consisting of folders and items.

Site Folders may be published as portlets and displayed on Portal pages. In addition to basic content, users may build and interact with database applications. Application components may be displayed in folders or displayed on Portal pages as portlets.

Oracle Portal provides an open architecture to integrate custom applications and content. It consists of three primary components:

1. Oracle Portal Framework - A framework for building and managing portal infrastructure.
2. Oracle Portal Publishing Services – Provides End user self-service web publishing.
3. Application Development - Provides the ability to build components for end user applications.

We will examine these primary components in this paper and provide some basic tips for planning your Oracle Portal solution.

Oracle Portal Framework

The Oracle Portal framework provides the mechanisms for representing information as information components. These re-usable components called "portlets" are displayed on portal pages.

Portal Pages

Pages are dynamically assembled and formatted according to the portlets, layout, style and security settings defined for the page. Pages are created by authorized users via a page creation wizard.

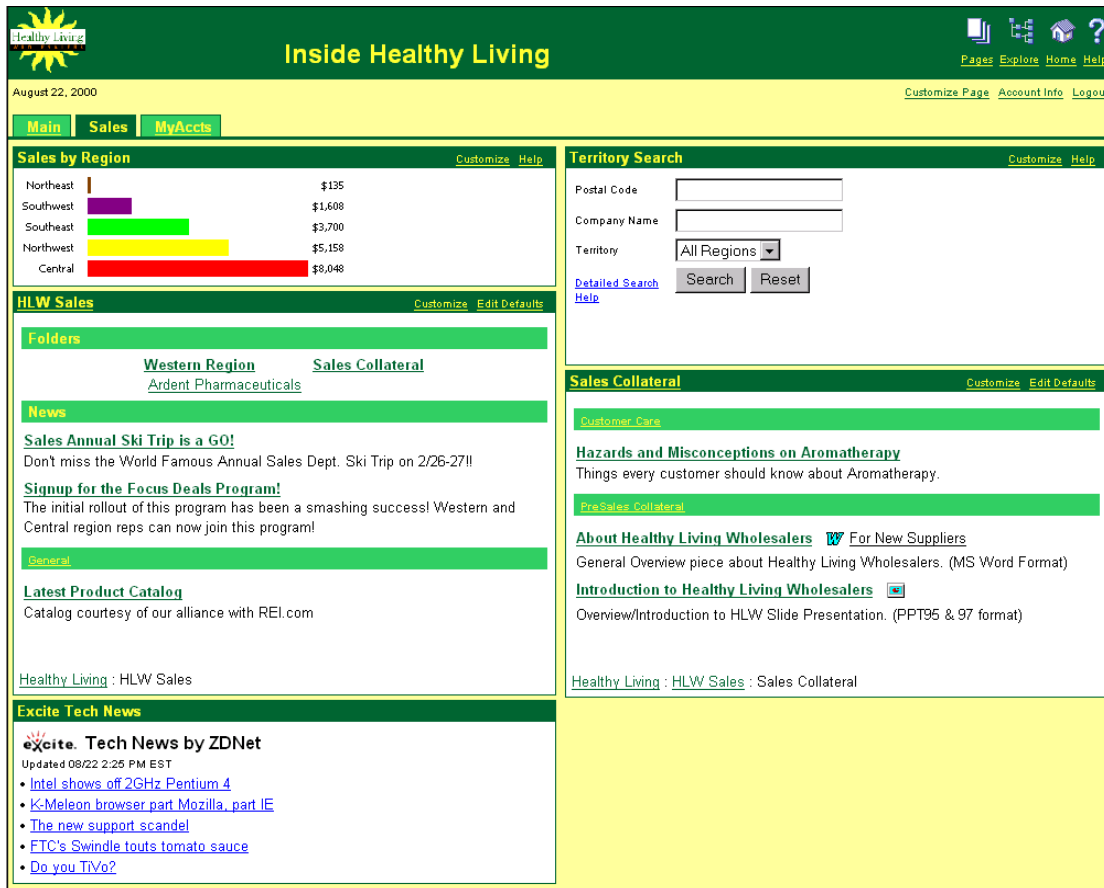


Figure 1: Sample Portal Page

The key features of a portal page are:

- **Page Layout**
- **Page Content**
- **Page Style**
- **Page Banner**
- **Page Security**

Page Layout

Page layouts are controlled by defining regions on the page. Each page is made up of one or more Regions. Each Region may contain one or more portlets. Regions may have their own specifications as to how portlets are displayed. For example, the user has the ability to hide portlet borders and headers.

Templates may also be used to speed page development. Templates contain pre-defined regions and properties. Once a page is created from a template, it may be further modified to achieve a specific layout.

Page regions may also contain tabs. Tabs allow a page owner to overlay or stack region content. Tabs may also contain specific privileges that override page level privileges.

Figure 2 shows the customization interface for a page. Page owners may use this interface to maintain the banner, regions, portlets, tabs, or control security access.

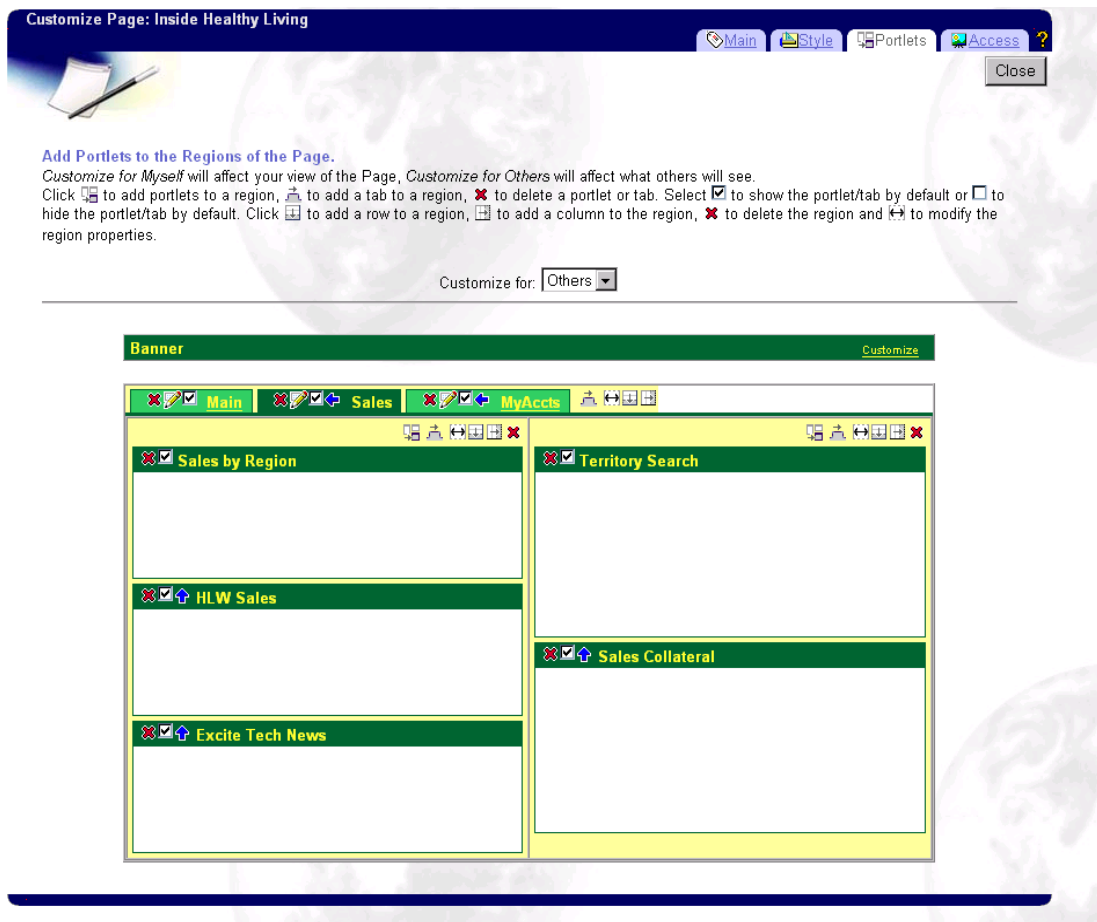


Figure 2: Page Customization Interface

Page contents - Page content represents the portlets displayed on the page. Portlets are available from portlet providers. The behavior of the portlet is controlled by the region properties. We will discuss portlets in more detail later.

Page Style - Page style controls the colors and fonts used to render a page. Styles are predefined templates and are assigned to a page by the page owner. Figure 3 shows the page style edit interface.

Page Banner - The Page banner improves the appearance of the page by displaying logos, background images, custom greeting messages, and navigation links.

Page Security -Page security controls the extent to which users or members of user groups are allowed to customize a page. Figure 4 shows the access tab for controlling security available from the "customize" page interface. In this screen, page owners can add users with varying privileges.

Portlets

A portlet is a standardized and secure object that produces a live area of HTML. Portlets can be applied in many ways – ranging from static hyperlinks to external applications to dynamically generated interactive modules.

There are three types of portlets:

- **Bundled Portlets**
- **Partner Portlets**
- **Custom Portlets**

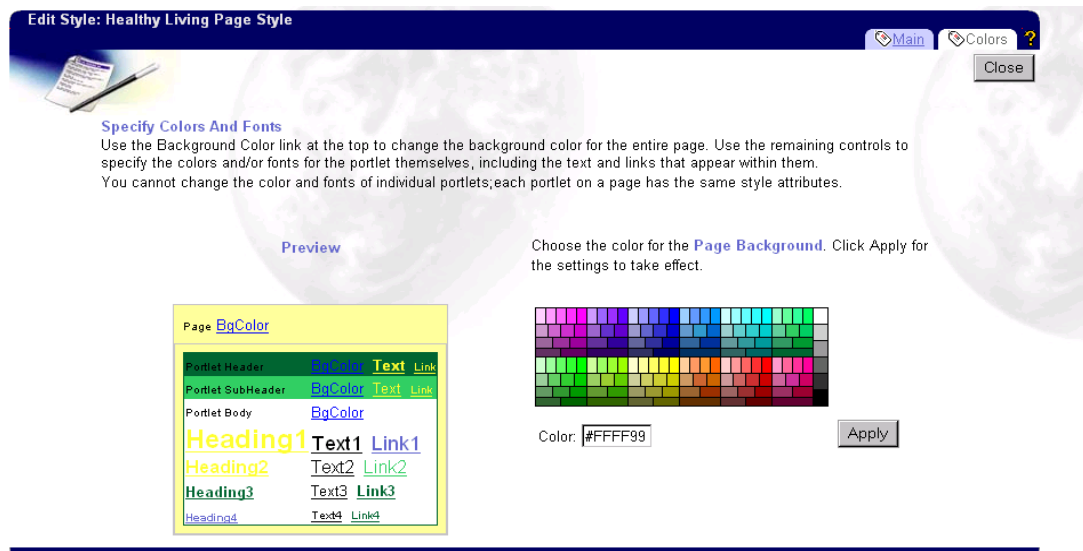


Figure 3: Style Editor Interface

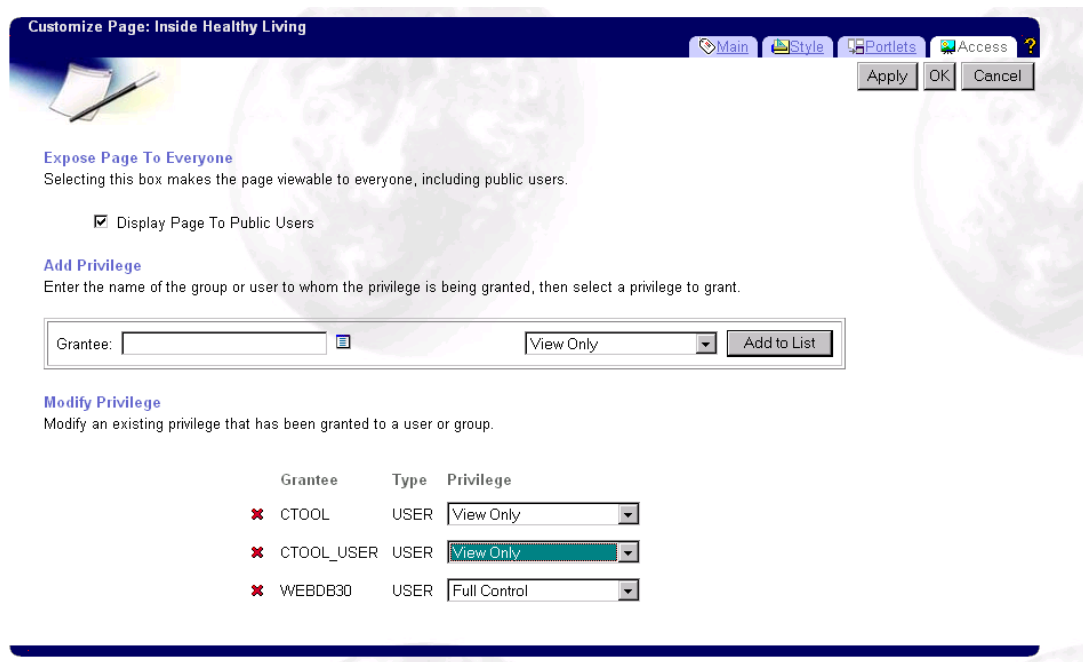


Figure 4: Customize Page – Access Tab for controlling Security

Bundled Portlets - Oracle Portal ships with a large number of bundled portlets. All major functions within Oracle are accessible via these portlets. These include Administration, Development, End User efficiency and Internet content.

Partner Portlets - A number of Oracle partners are creating standard, supported portlets to their applications and services through the Oracle Portal Partner Initiative. Oracle portal users will be able to access partners applications/services through one or more pre-integrated portlets. For example, Excite Stock Quotes and Factiva News are Partner Portlets.

Custom Portlets - Oracle Portal provides the facilities to create and maintain portlets, which access user specific content or applications. There are two methods to create custom portlets:

1. Built-in Portlets – Built-in portlets can be broken into the following categories:
 - *Folder Content* - Oracle Portal Site's publishing service allows users to organize, classify and manage their own content in a folder without the intervention of a Webmaster or developer. These folders may then be published as portlets.
 - *Structured data* - Oracle Portal Components gives developers the ability to build modules such as forms, reports and charts and publish them as portlets.
 - *Web Sites* - The “dynamic page” component provides a quick and easy way to build portlets from existing web site functionality. All that is required is a simple cut and past of the HTML source. Dynamic pages may then be published as portlets.
2. Programmatic Portlets – Oracle Portal supports this form of portlet creation through a public API. Portlet developers create a package or class that exposes methods required by the API. They must then register the portlet “provider” with Oracle Portal. Two implementation options exist for programmatic portlets.
 - *Stored Procedure* - Using PL/SQL or Java, developers can create stored procedures in Oracle 8i. The Oracle Portal framework communicates directly with these portlets using the gateway provided with the product. Stored procedures are very appropriate when significant interaction with the database is necessary.
 - *HTTP* – In this option, portlets and providers are implemented in any web deployment environment. Oracle Portal communicates with these providers and uses XML to send and receive structured data. This approach is most appropriate for web developers using third party tools.

Oracle Portal Publishing Services

Sites

Oracle Portal Sites allow users to upload and add content as opposed to Portal Pages where users may only display portlets. Oracle Portal Sites provide an infrastructure for self-service document publishing, file upload, and access control. Users may publish content and format layouts via simple User Interface (UI) controls and wizards. The site represents the top-level container for published content.

Key components of a site are:

- Folders – Contain and Display content
- Items -- The actual content within a folder.
- Styles – Defines folder look and feel (fonts, size, colors, etc.)
- Navigation bar -- Left Column to aid in site navigation.

Folders

An Oracle Portal Site is made up of folders that contain and display items. The site begins as a single root folder and expands in a hierarchical fashion as folders are added. Folders provide folder owners with options to control folder access and layout. Figure 5 illustrates a folder with the navigation bar.

Folders may be classified in one of four types:

1. *Container* – Contains Oracle Portal Items. This is the most frequently used type. Item types are discussed later in this document.
2. *PL/SQL* – Folder based on a PL/SQL stored procedure. Procedure output must be HTML.
3. *Search* – Contains the Result of a previously saved Oracle Portal search.
4. *URL* – Folder based on an external URL. Good for Integrating External content.

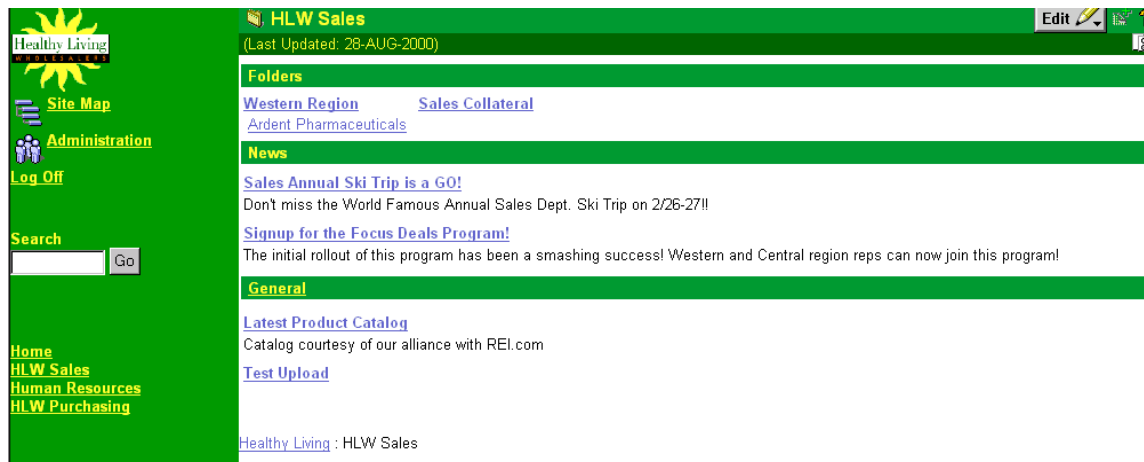


Figure 5: Folder interface with navigation bar on left.

Authorized users may edit folders to make changes by clicking on the “Edit” button. Figure 6 shows a folder in edit mode.



Figure 6: Folder in Edit Mode

In edit mode users may:

- Add, delete or modify items.
- Add folders.
- Modify folder properties including style and access.
- Modify the folder’s navigation bar. Options include inheriting navigation bar from parent folder or customizing the navigation bar at the folder level.

- Modify the style for any of the three main areas of a folder. (Figure 7 shows the three main areas: Navigation Bar, Banner, Content Area)

Folders are accessible in two ways:

- *Site* – Users may navigate to a specific folder in a site by navigating through the folder hierarchy of the site. In this view users can edit folders and modify content.
- *Portal page* – A folder may be published as a portlet and displayed on a portal page. This view is appropriate for users who are just viewing folder content and not modifying it. When exposed as a portlet, folders may not be edited. The navigation bar is not exposed as part of a folder portlet, but may be exposed as a separate portlet.



Figure 7: Three main areas of a folder

Items

Items are the basic elements of folders. Items have attributes associated with them depending on the type of item. Authorized users may create items via the “item wizard” (Figure 8). Items may also be classified in pre-defined “categories” and “perspectives”. This provides a mechanism for grouping related items.

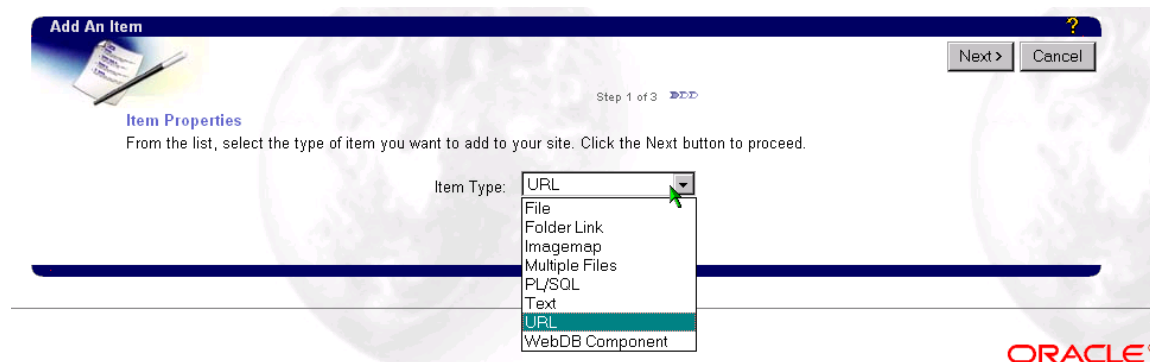


Figure 8: Item Wizard – Item Type Selection List

Oracle Portal is configured with seven default item types:

1. *File* – Used to upload files from an attached file system. Uploaded files are stored and managed within the Oracle Portal infrastructure in the database.
2. *Folder Link* – Creates an item that links to another folder within the site. Used to create shortcuts to frequently used folders.
3. *Image Map* – Creates an item that includes an image and its associated HTML code. An image map is an image where different areas hyperlink to different URLs. E.g. Map of US where clicking on each state will result in a different hyperlinks being called.
4. *PL/SQL* – Creates items that execute database-stored procedures. These items may be links that users click on to execute the code, or displayed output resulting from the procedure execution.
5. *Text* – Creates items consisting of text. The text may be displayed directly or displayed as a link. HTML tags may be embedded in the text to achieve desired formatting.

6. *URL* – Creates hypertext links to external Web sites. The referring page may be displayed directly or as a link.
7. *WebDB Component* – Creates items that link to Oracle Portal Application components such as forms, reports, and charts.

Styles

Styles provide the ability to customize the look and feel of a site. Using the style manager, folder owners may control attributes such as folder region layout, fonts, colors, background images and XSL style sheet for rendering.

Edit Style (Content Area) : HEALTHYLIVING

Path: FOLDER/HEALTHYLIVING/HLWSALES/

Specify Style Properties
Type a title for your style and select whether other users can use your style in their own folders.

Title: HEALTHYLIVING

Usage: Private Public

Choose Folder Path Location
Choose where in the content area you want to display the folder path. The folder path shows where the currently displayed folder is in the folder hierarchy and provides links to the folders higher in the hierarchy.

Display Folder Path: Bottom

Select Folder Region Layout
Select how you want to arrange the different regions of the content area. The layout of the regions determines the overall flow of items and subfolders.

Specify XSL Style Sheet (Not available in Beta)
Specify an XSL style sheet to use to set the style and layout of the content area, if preferred.

XSL StyleSheet: Browse...

Figure 9: Style Editor for Content Area

Navigation Bar

The navigation bar helps users to easily navigate around a site. It always appears whenever a folder page is displayed. Folder owners may create customized navigation bars for each folder. Folder owners create or edit navigation bars via the navigation bar manager.



Figure 10: Navigation Bar Manager Interface for editing the Navigation Bar

The navigation bar may contain one or more of the following elements:

- Logos
- Site Map Link
- Administration Link
- Log on/log off Links
- Contact Link
- Folder Links (1 or more folders from within the site)
- Category Links (group of links, drop down list, or icon)
- Perspective Links (group of links, drop down list, or icon)
- Search Link (Basic or Advanced)
- Customized Text
- Images
- URLs

Application Development

Oracle Portal Components are the building blocks for creating web-based database applications. Applications in Oracle Portal may consist of one or more components. Application components may be deployed as content in a site folder or as portlets to be placed on any Portal page. Oracle Portal includes a set of ten pre-defined component types. Developers may create any of these components by following a series of wizard-driven steps. Figure 11 shows a typical interface for component development.

The screenshot displays the Oracle Portal Form Creation Wizard interface. At the top, the window title is "FORM_0905144801". The progress bar indicates "Step 4 of 7" with a progress indicator. The main heading is "Formatting and Validation Options". On the left, a list of form items is shown, including "FIRST_NAME", "MIDDLE_INITIAL", "JOB_ID", "MANAGER_ID", "HIRE_DATE", "SALARY", "COMMISSION", "DEPARTMENT_ID" (highlighted in yellow), "*BOTTOM_SECTION*", "PREVIOUS", "NEXT", and "INSERT_BOTTOM". Each item has a small icon and navigation arrows. On the right, the "Item-Level Properties for : DEPARTMENT_ID" are displayed. The "Item type" is set to "Radio Group". Under the "Appearance" section, the "Label" is "Department Id", "Font Face" is "Browser Default", "Font Color" is "Black", and "Font Size" is "+0". The "Input width" is "15", "Input height" is "1", and "LOV" is "%". Navigation buttons at the top right include "< Previous", "Next >", "Finish", and "Cancel".

Figure 11: Form Creation Wizard Interface

The basic components within Oracle Portal are:

- **Forms**

The form component is used to build HTML screens for interacting with data. Forms may be used for querying inserting, updating or deleting data. In addition Oracle Portal provides the item level event handlers, which may be written in PL/SQL or JavaScript. Forms may be based on a single table/view or against two tables in the case of a Master-detail Form.

- **Reports**

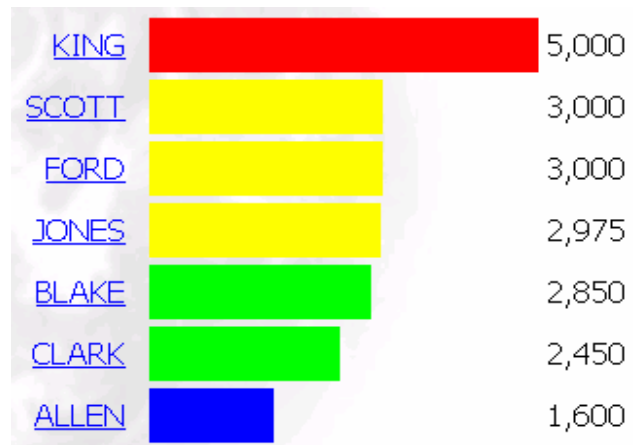
The report component can be built using any of three approaches:

- [1] Wizard reports can be created by clicking through a wizard to select appropriate tables/columns and display options.
- [2] SQL reports involve creating a report based on a SQL query.
- [3] Query By Example (QBE) reports allow the user to query, insert, update or delete rows from the result set of the report. Users may hyperlink out to other components. For example, clicking on an Empno value in this example will open a Form to allow the user to update the record.

Empno	Name	Job	Manager	Hiredate	Salary	Comm	Deptno
7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20
7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30
7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30
7566	JONES	MANAGER	7839	02-APR-81	2975	(null)	20
7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30
7698	BLAKE	MANAGER	7839	01-MAY-81	2850	(null)	30
7782	CLARK	MANAGER	7839	09-JUN-81	2450	(null)	10
7788	SCOTT	ANALYST	7566	09-DEC-82	3000	(null)	20
7839	KING	PRESIDENT	(null)	17-NOV-81	5000	(null)	10
7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30
7876	ADAMS	CLERK	7788	12-JAN-83	1100	(null)	20
7900	JAMES	CLERK	7698	03-DEC-81	950	(null)	30
7902	FORD	ANALYST	7566	03-DEC-81	3000	(null)	20
7934	MILLER	CLERK	7782	23-JAN-82	1300	(null)	10
9999	GGFGF	ANALYST	7782	23-JUL-00	1000	(null)	(null)

- **Charts**

The chart component is used to create simple HTML based bar charts. Like the report component, charts may be created from a query wizard or a SQL query. Summary functions such as maximum, minimum, average, and count are available in the chart. Hyperlinks from chart labels to other components can also be created. For example, clicking on an employee name in the chart at right will call a form to update the employee's record.



- **Dynamic Pages**

The dynamic page component is one of the more powerful Oracle Portal components for building attractive web solutions. It provides developers with the ability to combine PL/SQL code segments within HTML. Hence developers may create attractive pages in HTML and embed Oracle code between <ORACLE> and </ORACLE> tags. Any valid PL/SQL may be used here including procedure or function calls.

```

HTML
<HTML>
<HEAD>
<TITLE>Example</TITLE>
</HEAD>

<BODY>

<H1>Example of A Dynamic Page</H1>
<ORACLE>select * from WEBDB30_DEMO.emp where deptno
= :department</ORACLE>

</BODY>

</HTML>
  
```

The images on the right show the HTML for a dynamic page and its output while the images below show 2 portlets based on images and the same portlets being used on a Portal page. As illustrated, Dynamic pages do not necessarily need PL/SQL code embedded within the HTML. Dynamic Pages are very powerful for building Oracle Portal pages when exposed as portlets.

Example of A Dynamic Page

7782 CLARK	MANAGER	7839	09-JUN-81	2450 (null)	10
7839 KING	PRESIDENT	(null)	17-NOV-81	5000 (null)	10
7934 MILLER	CLERK	7782	23-JAN-82	1300 (null)	10

The screenshot shows the CriticalTool website interface. At the top, there's a navigation bar with 'Home', 'Buy', 'Sell', 'My CriticalTool', and 'Help'. Below this is a 'Post Quote' process flow with four steps: 1. Post Quote, 2. Check Responses, 3. Select Winner, 4. Order. The main content area is divided into several product categories: Industrial Supplies (Drills, Files, Reamers & Counterbores), Office Supplies (Basic Office Supplies, Binders & Accessories), Scientific Products (Laboratory Equipment, Laboratory Instrumentation, Laboratory Supplies), and Calendars, Organizers & Business Cases. Each category has a brief description and links for 'more' and 'RFQs'. There are also logos for Visa, MasterCard, and a 'Secure Site' badge.

- **Calendars**

The calendar component is used to display database data in calendar format. The data returned in the calendar is based upon a specified SQL Query.

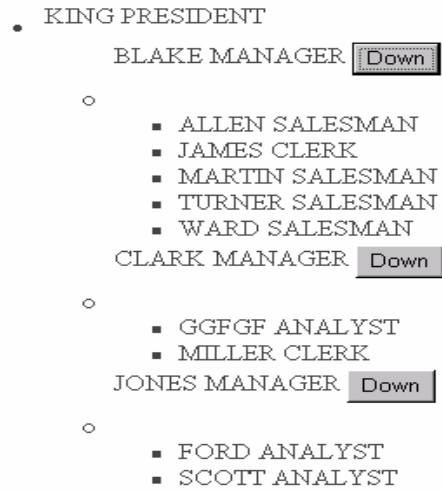
September 1981

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		01	02	03	04	05
06	07	08 TURNER	09	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28 MARTIN	29	30			

Developers have the option of defining hyperlinks from calendar dates or values to other components or URLs.

- **Hierarchies**

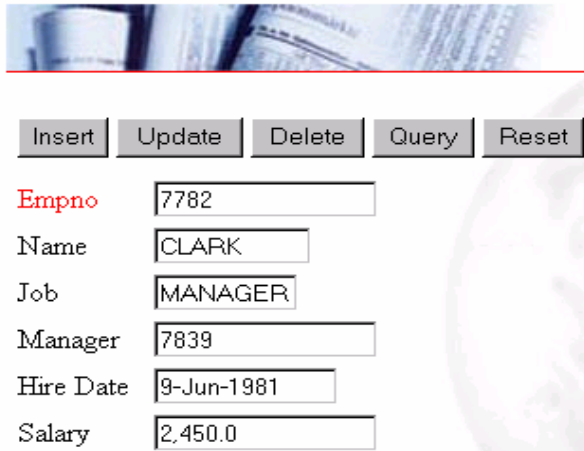
The Hierarchy component is used to display data that is in a hierarchical format and suitable for drilling up and down. One limitation of hierarchies is a hierarchy may only display 3 levels at a time. Users can drill through the hierarchical data using “Up” and “Down” buttons. Hyperlinks may be created from hierarchy values to other components. An organizational chart is a good example of this type of structure.



- **Frame Driver**

The frame driver component is used when the selection in one frame is needed to drive the contents of another frame. A SQL query in the driving frame controls the content of the target frame. The contents of the target frame may be HTML, PL/SQL code, or a URL. In this example, selecting 'CLARK' from the drop down list of values in the top frame will drive the result set in the Query By Example (QBE) form in the lower frame.

Elapsed Time: .08 second(s)



Empno	<input type="text" value="7782"/>
Name	<input type="text" value="CLARK"/>
Job	<input type="text" value="MANAGER"/>
Manager	<input type="text" value="7839"/>
Hire Date	<input type="text" value="9-Jun-1981"/>
Salary	<input type="text" value="2,450.0"/>

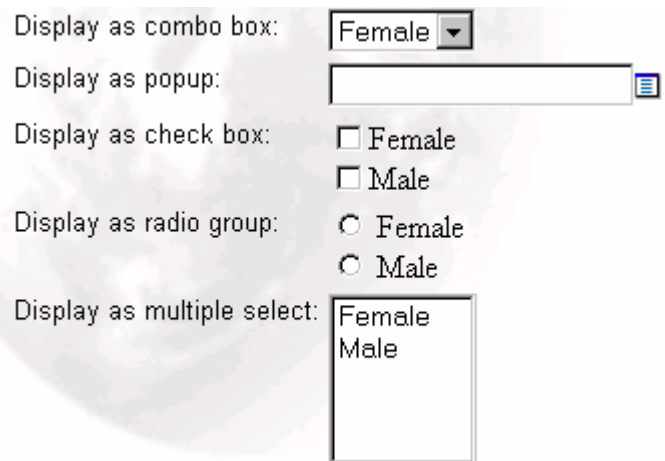
- **Menu**

The menu component is used to display links to other Oracle Portal components, URLs, or submenus. It serves as a jumping off point for application components. Descriptive text may be added to any menu item. Security can also be applied to items via database roles.

- [Charts](#)
- [Dynamic Pages](#)
- [Calendars](#)
- [Menus](#)
- [Hierarchies](#)
- [Forms](#)
- [Reports](#)

- **List of values (LOV)**

The List of values component allows users to select a value for a field from a list of possible values. This simplifies data entry for a user and also enforces valid values. LOVs come in many formats as indicated on the right. They include combo boxes, popups, check boxes, radio groups, and multiple select. Developers can attach an LOV to any field and select the display format for the LOV. The multiple select option is useful for report parameters. The result set for the LOV can be static or dynamic. Dynamic LOVs retrieve data from tables in the database through SQL.



The image shows a list of display options for a List of Values (LOV) component. Each option is followed by a visual representation of that format:

- Display as combo box: A dropdown menu with "Female" selected.
- Display as popup: A text input field with a list icon on the right.
- Display as check box: Two checkboxes, one for "Female" and one for "Male".
- Display as radio group: Two radio buttons, one for "Female" and one for "Male".
- Display as multiple select: A text input field containing "Female" and "Male" on separate lines.

- **Links**

The link component is used for linking components and passing values between components. A Link may be defined to point to a component, a component parameter form, or an HTML link.

Planning Your Oracle Portal Solution:

There are a few basic factors to consider when planning your portal pages or self-service web publishing folders. These include:

1. Security
2. Content
3. Layout & Style

- **Security** - Security is important for many reasons in planning your site. Apart from the obvious reason to control access, Security is useful in determining who your various groups of users are going to be. Once user groups are determined it becomes easier to define content appropriate to each user group. This approach is valid for both self-service web publishing as well as Portal pages.
- **Content** - Content is defined by evaluating a user group and determining what items the group will access.

In the case of self-service web publishing, this will be useful for determining which users will be able to view each folder and its content. If some items span across groups, they should be placed in folders available to many groups. Folders may also be determined by considering the subject matter. For Example, content can be restricted departmentally, such as HR, Sales, or can be restricted by location such as Europe, North America.

In the case of pages, the content is similarly determined. The difference being Pages instead of folders, and with the inclusion of tabs, a page may be further broken down with each tab having its own security settings.

The actual detailed content for your solution may then be created and applied to folders as items or Pages as portlets. In addition Items may also have privileges assigned to them. These would supercede the setting at the folder, page or tab level.

- **Layout & Style** - The attractiveness and ease of use of a site is frequently the key in gaining acceptance. It is therefore important to layout the site in an aesthetically appealing and user-friendly format. This can be accomplished by using accepted layouts and picking the right fonts and colors for the site. If you are not graphically inclined, it is recommended that a web designer define the style and layout of the site. In Oracle Portal, colors and fonts for various sections of a site may be predefined and saved as a style. These styles may then be applied to any page or folder during development.