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DATA-DRIVEN USER INTERFACES USING ORACLE PORTAL

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Oracle Portal is being used as a development platform for applications requiring relational database access, for the control system and operations of the accelerator facilities. The underlying technology is based on portlets and dynamic, thin client HTML representation of the database information. Prototype Application Programming Interfaces (APIs) have been customized for sections of the Controls Inventory Database (CIDB). The API's are reusable code constructs in PL/SQL and JavaScript.

INTRODUCTION

Web application development for controls and operations of the accelerator facilities requires the creation of Graphical Users Interfaces (GUIs), with access to real-time variables as well as to data stored in a relational database. This is an important customisation effort, involving multiple design, coding, testing and debugging cycles.

While custom applications are difficult to include in a portal, they are the most sought-after. To achieve this, Oracle Portal [1] is used for the development of content-driven websites that reside entirely in an Oracle database. These sites are composed of components called portlets that provide access to web-based resources. Web pages, forms, reports, menus, etc are accessed through a portlet, which can be customized and managed as a component within Oracle Portal.

The Portal framework also provides additional services including Single Sign On (SSO), content classification, search and security. Access to the development tools is platform independent.

IMPLEMENTATION

One of the requirements in building the GUI's is *interportlet* communication - where one portlet triggers an event and updates another portlet on the same page [2]. The wizard building tools of Portal are not sufficient in themselves, due to limitations of HTML to incorporate the desired features required by the end-user. In order to accommodate these, PL/SQL, JavaScript and Oracle's Portal Development Kit (PDK) are exploited.

An example of a generic page, consisting of three inter-communicating portlets is shown in Fig. 1.

The upper portlet represents the topmost information of a hierarchical structure of data (generic), for which the drill-down details are displayed and can be modified in the middle and lower components respectively.

More specifically, upon change of the value in the combo-box of portlet 1, a JavaScript event handler passes the input parameter to the middle component (portlet 2), which is a report; and after a page refresh, the results are displayed on the same HTML page. Similarly for the lower component (portlet 3), which is a form component, and serves to display the details of

a record selected in portlet 2 via a hyperlink. Portlet 3 also contains buttons in order to modify or delete the displayed record.

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Fig. 1: Portlet components on Portal page.

The essential features in terms of the interactions between the portlets and the database are the JavaScript event handlers and PL/SQL code (stored procedures and triggers) for queries and updates against the database.

In addition, the PDK API's are used to set and retrieve the session-storage context, in order to preserve data integrity during transactions in concurrent sessions.

These features have been successfully implemented, albeit preliminary, for applications in the context of CIDB.

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- [1] Oracle Corporation, http://www.oracle.com
- [2] T. Pal *et al.*, *Database Applications for Control System Hardware Management*, PSI Scientific and Technical Report 2003, Volume VI.