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Cloud Computing Using Oracle Application Express

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Printed on acid-free paper

I dedicate this book to the person who taught me how to hold a pencil—my mother.

I'm here because of her.

I also dedicate this book to my wife, who is always behind me in these endeavors.

Contents at a Glance

Contents

About the Author

Riaz Ahmed is an IT professional with more than 23 years of experience. He started his career in early 1990s as a programmer and has been employed in a wide variety of information technology positions, including analyst programmer, system analyst, project manager, data architect, database designer, and senior database administrator. Currently he is working as the head of IT for a group of companies. His core areas of interest include web-based development technologies, business intelligence, and databases. Riaz possesses extensive experience in database design and development. Besides all versions of Oracle, he has worked intensively in almost all the major RDBMSs on the market today. During his career he designed and implemented numerous databases for a wide range of applications, including ERP. You can reach him via `oratech@cyber.net.pk`.

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Preface

If someone had asked me to write this book two decades ago, I would have simply refused the suggestion—not because I couldn't do so but because of the mountain of code necessary to create the application with its menus, forms, reports, and so on. The appearance of GUIs and RAD has not only eased the burden on developers but has also enabled application development to be easily demonstrated in book form.

Oracle Application Express (APEX) is a unique development platform that helps you develop cloud-based applications rapidly. In my book *Oracle Application Express 5 for Beginners*, I practically demonstrated almost every significant feature of Oracle APEX. This book is an attempt to take my readers to the next level with some more useful stuff.

You might be one of those readers who is already familiar with Oracle APEX and has some experience in developing simple applications but who lacks the required knowledge that is needed to develop a comprehensive system. In this book, you will bridge this gap by developing a complete general ledger accounting system named The Cloud Accountant, which will be accessible through a variety of devices including desktops, laptops, and the latest smartphones. Besides the development of a functional application (which you can deploy in your organization or even in other organizations to earn some handsome bucks), the book demonstrates many new techniques to further enhance your APEX development skills.

This book is also ideal for those who have been developing applications in Oracle Forms and now want to try web development using their existing expertise.

If you know what Oracle Application Express is and are also comfortable with SQL and PL/SQL, then grab this book to learn something that is not available anywhere else. If you are a novice, then you are encouraged to read my book *Oracle Application Express 5 for Beginners* (ISBN-13: 978-1-512-00330-7).

Good luck!

CHAPTER 1

Introduction to Cloud Computing and the Application Project

The phenomenal growth of information technology—especially the advent of cloud computing—is changing the landscape of information technology, business, and personal computing. If applied correctly, information technology can increase the productivity of enterprises and enable them to focus on increasing profits and lowering costs. Cloud computing in its simplest form means accessing and storing data and applications over the Internet, instead of on a native computer's hard drive. The purpose of this book is to give you a taste of cloud computing by developing a functional general ledger accounting system for and in the cloud.

1.1 An Introduction to Cloud Computing

Swift adaptation is the key to success for the survival of any business in today's dynamic economic environment. If one is running a profitable business today, this doesn't mean that the current business model will provide the same growth in the future. In addition to adapting to changing government regulations, businesses must explore and implement new areas to cope with current IT trends. In this book, you will be given a taste of cloud computing, which provides an effective computing infrastructure for today's business whenever or wherever it is needed.

Many businesses have already switched their IT resources to the cloud because, according to them, this model delivers a more cost-effective and efficient way to serve their customers, partners, and suppliers. In contrast, there are many businesses that are looking at this model more cautiously with respect to the security of their business processes and intellectual assets. The biggest advantage provided by cloud computing

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is that it eliminates many of the complex constraints found in the traditional computing environment, including cost, space, time, and power.

The following are the three main types of cloud services being delivered by various cloud service providers:

- *Infrastructure as a Service (IaaS)*: In this type, the service provider delivers computer hardware (servers, operating systems, virtualization technology, networking technology, and storage) as a service. Amazon's Elastic Compute Cloud (Amazon EC2) is a good example of IaaS in which a web interface is provided to customers to access virtual machines.
- *Platform as a Service (PaaS)*: This layer offers development environments to IT organizations to develop Internet-facing cloud applications.
- *Software as a Service (SaaS)*: This is one of the first implementations of cloud services where a service provider hosts business applications in its own vicinity and delivers them to its customers.

1.2 Public vs. Private Cloud

The primary objective of designing applications in Oracle Application Express (APEX) is that these applications are accessible anywhere and at any time. APEX, hence, neatly supports cloud computing. To achieve this objective, you are provided with the following two cloud deployment models to host your applications:

Public cloud: A public cloud is a computing model wherein a service provider provides computing resources to the general public over the Internet. These resources include hardware, networks, storage, services, and applications. Public cloud services may be free or offered on a pay-per-usage model. Some companies (including the Oracle Corporation) offer a database cloud service, which has two main components: *RESTful web service access* (which allows access to the data in your database cloud service through simple URIs) and *Oracle Application Express* (for creating and deploying all kinds of applications in a browser-based environment). The database cloud service is simple to obtain, simple to administer, and simple to use to develop and deploy all types of applications. This simplicity is complemented by a simple pricing structure, based on only two metrics: storage and data transfer. In addition, the simplicity of the public cloud means lower costs for your own IT staff. Universal access to the components of the public cloud through a browser dramatically simplifies the maintenance overhead for your cloud-based solutions. Applications delivered through the public cloud can be accessed from a wide variety of client platforms including Windows, Apple, or mobile devices. Oracle Corporation provides its own cloud computing platform called Oracle Cloud. For further details, see `https://cloud.oracle.com`.

Private cloud: This term refers to the data centers inside your company's firewall. Within your organization you can have a single Oracle Database supporting many departments with each having their own workspaces to build applications. Each of these workspaces can be granted access to one or more schemas as appropriate. The term may also apply to a private space dedicated to your company within a cloud provider's data center. Private clouds enable organizations to have complete control and visibility over security, regulatory compliance, service levels, and functionality.

Oracle APEX applications are built on technology that resides within an Oracle Database, so all your applications can be easily run on any Oracle platform, from the Oracle Database Cloud Service to your in-house data center to Oracle Database XE on your laptop. Once you have developed an application either on your PC or in the cloud, simply export the application and then import into any other Oracle Database where you have a compatible version of APEX installed. Naturally you may also deploy your application on the Oracle Database Cloud Service and then allow access to it from anywhere in the world.

1.3 What Is Accounting?

Since you will be developing an accounting application in the upcoming chapters, it is necessary to have a little background of accounting. Accounting can be defined as follows: the systematic recording, reporting, and analysis of financial transactions of a business. Accounting provides financial information to stakeholders. Stakeholders include banks, suppliers, investors, government agencies, and people engaged with an organization, such as its owners and employees. Banks need financial information to assess the condition of a firm before lending money. A profitable organization with positive cash flows can easily acquire loans as compared to one suffering heavy losses and little money. Suppliers need financial information to consider trade credit. Investors will invest their money only in profitable organizations. They determine the profitability of an organization by reading its financial statements. Every business concern is bound by law to report on its revenue and expenses to local government agencies for income tax purposes. In a nutshell, accounting performs the following tasks:

- Evaluates profit or loss of a business concern
- Provides detailed information about a firm's net worth
- Reports on assets, liabilities, owner's equity, and profitability

1.4 Accounting System

Organizations use accounting systems (either manual or computerized) to store, manage, and provide their financial information to their stakeholders. These systems are implemented to produce financial statements, including income statement, balance sheet, and other accounting reports. They store detailed records of accounts, such as cash, accounts receivable (due from customers), accounts payable (due to suppliers/banks), fixed assets, stocks, and so on. This book will teach you how to develop a computerized accounting system to store the financial information of a fictitious company in an organized manner and will provide instructions for creating all the generic financial reports that will be produced with a mouse click.

1.5 General Ledger

In enterprise resource planning (ERP) software, the general ledger module works as a central repository for accounting data transferred from other modules such as fixed assets, product planning, material purchasing, inventory control, distribution, marketing, and HR. A general ledger carries all the accounts for recording financial transactions relating to a company's assets, liabilities, owners' equity, revenues, and expenses. It is known as the backbone of any accounting system because it ties together all of the component transaction processing cycles and systems in an organization.

A sound general ledger system has the following broad objectives:

- Recording of all accounting transactions promptly and accurately
- Posting of transactions to the proper accounts
- Maintaining an equality of debit and credit balances among the accounts
- Generating reliable and timely financial reports for stakeholders

The following are the major functions performed by a general ledger system:

- *Data collection*: Business transactions arise when some sale or purchase event occurs. In the real world, these transactions are handled by their respective operation processing systems, such as sales and purchase systems. These systems interface with the general ledger system in order to feed their daily transactions. Transactions arising from other sources are recorded though specially designed forms, called vouchers. You will use the latter method in this book for transaction processing.
- *Classification and coding*: For proper maintenance of accounts, daily transactions are classified and coded according to a prescribed chart of accounts.
- *Validation*: To ascertain the accuracy of data, every transaction goes through a process of validation that is implemented through various control procedures. These validations include checks on amounts, use of valid account codes from the chart of accounts, transaction period verification, and so on.

- *Reporting*: A general ledger system provides three primary financial statements: income statement, the balance sheet, and a statement of cash flows. While the most familiar financial outputs are the financial statements, numerous other reports (for example, trial balance, ledgers, budget variance reports, and so on) are also generated by a general ledger system to fulfill the information requirements of the stakeholders.

1.6 The Cloud Accountant General Ledger Project

Running your business gets a whole lot easier when you can access your books anywhere and anytime. The Cloud Accountant being developed in this book is a complete double-entry cloud accounting application that lets you keep in touch with your business all the time. The intensely competitive market in today's economy requires that managers continuously improve the way they work and make decisions. Today's successful managers demand instantaneous information that is both accurate and useful. A traditional desktop accounting system simply cannot cope with these high demands. Only by taking advantage of the power of the latest technology can these demands be met.

The goal of the Cloud Accountant is to remove most of the boring bookkeeping work from the business. The application will take over all the simple and monotonous tasks that can eat up precious time. For instance, it will automate all period-end tasks such as closing the books, transferring the closing balances forward, and so on, with just a few clicks. It also facilitates the recording of all purchase and sales transactions, bill payments, and so on. Since the application can process and retrieve business transactions instantly, there will be a quicker response time to customers, suppliers, and creditors, which will ensure better business relations. In addition, it will produce professional-looking financial reports and accounting records quickly and easily. The Cloud Accountant will free up more time, which can be used to work on improving other areas of the business.

A paperless environment means less work and less confusion since all information is stored electronically and can be accessed instantaneously. A computerized system will also produce more accurate records. The logic created in this application ensures that all entries are posted properly and that the calculations of key financial data are done correctly. This greatly reduces the potential for human error that is prevalent in manual accounting systems. Because of the inherent structure within the Cloud Accountant, the accounting system around the computer will be simplified and more organized. As a result, the flow of information in all stages of the business cycle will be more logical and efficient. Of great importance are the security features built into the application, which ensure that only authorized people have access to company's sensitive financial information. In this application, you will define your own security levels that will allow users to access only what you want them to access. This ensures that data will remain safe, can be easily maintained, and is neat and organized.

1.7 Development Environment

Although you can develop the application locally on your own PC, it is a good idea to develop it in the cloud. This way, not only will you enjoy a new development environment, but you will also have a complete infrastructure provided by Oracle available for you. Create a free workspace on `https://apex.oracle.com`. After creating the workspace, create a new desktop database application, which will contain Home and Login pages by default. My application is named The Cloud Accountant, and I associated it with a new schema named GL. I selected Universal Theme (42) for the application, and for the time being set Authentication Scheme for the application to the default Application Express Accounts scheme. Later you will create a custom authentication scheme to implement a custom authentication and application access mechanism.

1.8 Application Segments

Table 1-1 lists all the segments of this application you will develop in this book.

Table 1-1. *Application Segments*

Menu	Application Segment	APEX Page Number
Home	Home (Executive Dashboard)	1
Setup	Companies	3, 4
	Fiscal Year	5
	Voucher Types	7, 8
	Application Segments	19, 20
	User Groups	21
	Users	22, 23
	Cost Centers	13, 14
	Chart of Accounts	15, 16
	Opening Bank Transactions	17
	Accounts for Financial Statements	18
Select	Switch (Company, Year, and Month)	30
Transactions	Vouchers (to record transactions)	42, 43, 44
Utilities	Reconcile Banks	51, 52
	Search Transaction	53
	Copy Chart of Accounts	54
	Budget Allocation	55
	Reset Password	56

(*continued*)

Table 1-1. (*continued*)

Menu	Application Segment	APEX Page Number
Reports	Vouchers	71
	Ledgers	72
	Trial Balance	73
	Bank Reconciliation	74
	Budget	75
	Financial Statements	76–77
	Feedback Report	302
Closing Process	Vouchers Verification	94, 95
	Month Closing	96
	Temporary Year End	93
	Permanent Year End	97
Mobile App	Mobile version for management	6, 102–111, 1001, 9999
Feedback	Get feedback from users	300

As a taste of what's to come, Figure 1-1 shows a glimpse of the completed application you are about to build.

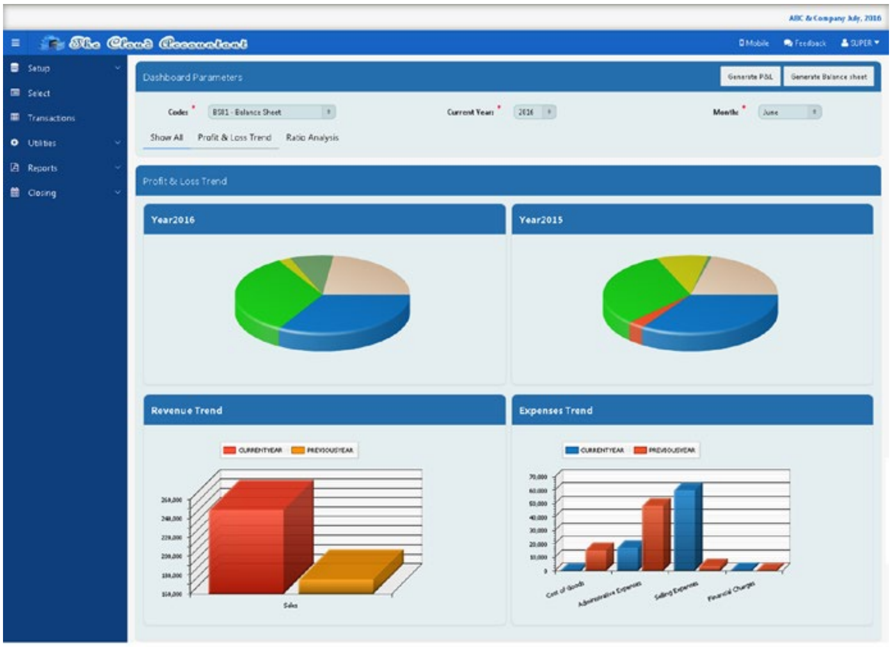

Figure 1-1. *Completed application*

1.9 Summary

In this chapter, you went through some basic concepts about cloud computing. Besides being introduced to the three most common types of cloud services, you were briefed about public and private clouds. The basic objective of this book is to reveal how Oracle APEX fits into the cloud computing model with respect to business applications. To achieve this objective, you will create a GL project that will also enhance your development skills. In the next chapter, you will be provided step-by-step instructions to initiate the project, starting with the application navigation.

CHAPTER 2

Application Navigation

Previous versions of APEX used tabs that acted as an application's main menu up to version 4.2. In version 5, a default navigation list named the *desktop navigation menu* was introduced as a shared component for each new application. This provides the user with a hierarchical set of pull-down menus and submenus. It is displayed as a responsive sidebar. Based on the available space, the navigation bar either displays as a full menu or collapses to a narrow icon bar.

2.1 Create the Main Application Menu

The default desktop navigation menu carries just one item (Home). In this chapter, you'll modify this list to add more application menu entries. Follow these instructions to complete this exercise:

1. In Shared Components, click the Lists option in the Navigation section.
2. Select the Desktop Navigation Menu option, which carries a default entry (Home) created by the application builder wizard. Modify this entry by clicking its name. In the attributes page of the Home menu item, click the pop-up LOV icon to the right of the Image/Class attribute to display a list of possible icon images for the Home menu option. At the top of the icon list you will notice two options: Show and Category; set Show to Font Awesome Icons, and set Category to Web Application. Click the Go button to refresh the view and then select the fa-home icon from the icons list. This image will be displayed for the Home menu at run time. Hit the Apply Changes button to save your work. With practice you will get to know the icon names and can type them directly in the Image/Class attribute to save time. If you do not see the specified icon, select anyone you like from the list.

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3. Click the Create List Entry button to create a new menu item. Enter the values shown in Table 2-1 against the specified attributes. You won't select anything for the first attribute (Parent List Entry) because initially you will create level-one entries that do not have parent entries. The target is either a page in the current application or any valid URL. In this case, the Setup menu entry itself is not associated with any application page, so its Target Type is set to No Target.

Table 2-1. *Create First Level 1 Menu Item*

Attribute	Value
Parent List Entry	No Parent List Item
Image/Class	fa-database
List Entry Label	Setup
Target Type	No Target

4. Using the button Create and Create Another, save the previous entry and create five more level-one entries, as shown in Table 2-2. Combined, the Target Type and Page attributes inform APEX where to land when a menu item is clicked.

Table 2-2. *Create More Level 1 Menu Items*

Parent List Entry	Image/Class	List Entry Label	Target Type	Page
No Parent List Item	fa-list-alt	Select	Page in this Application	30
No Parent List Item	fa-table	Transactions	Page in this Application	42
No Parent List Item	fa-gear	Utilities	No Target	
No Parent List Item	fa-file-pdf-o	Reports	No Target	
No Parent List Item	fa-calendar	Closing	No Target	

Tables 2-1 and 2-2 show how to construct the main menu of your application. Again, for each of these, you set Parent List Entry to No Parent List Item. Note that the Setup, Utilities, Reports, and Closing entries have no target because these entries are not directly linked to application pages; they link to submenus. In the next step, you will create the submenus for these main entries.

5. Create level-two menu entries using Tables 2-3 to 2-6. These entries will appear under their respective main menu (specified under the Parent List Entry column).

Table 2-3. *Setup Menu*

Parent List Entry	Image/Class	List Entry Label	Target Type	Page
Setup	fa-building	Company	Page in this Application	3
Setup	fa-calendar-o	Fiscal Year	Page in this Application	5
Setup	fa-money	Voucher Types	Page in this Application	7
Setup	fa-sitemap	Application Segments	Page in this Application	19
Setup	fa-users	Groups	Page in this Application	21
Setup	fa-user	Users	Page in this Application	22
Setup	fa-tasks	Cost Centers	Page in this Application	13
Setup	fa-newspaper-o	Chart of Accounts	Page in this Application	15
Setup	fa-bank	Opening Bank Transactions	Page in this Application	17
Setup	fa-bar-chart	Financial Statements	Page in this Application	18

Table 2-4. *Utilities Menu*

Parent List Entry	Image/Class	List Entry Label	Target Type	Page
Utilities	fa-bank	Bank Reconciliation	Page in this Application	51
Utilities	fa-search	Search Transaction	Page in this Application	53
Utilities	fa-cc	Copy Chart of Accounts	Page in this Application	54
Utilities	fa-calculator	Budget Allocation	Page in this Application	55
Utilities	fa-ellipsis-h	Reset Password	Page in this Application	56

Table 2-5. *Reports Menu*

Parent List Entry	Image/Class	List Entry Label	Target Type	Page
Reports	fa-money	Vouchers	Page in this Application	71
Reports	fa-book	Ledgers	Page in this Application	72
Reports	fa-reorder	Trial Balance	Page in this Application	73
Reports	fa-bank	Bank Reconciliation	Page in this Application	74
Reports	fa-calculator	Budget	Page in this Application	75
Reports	fa-bar-chart	Financial Statements	Page in this Application	76
Reports	fa-comments	Feedback	Page in this Application	77

Table 2-6. *Closing Menu*

Parent List Entry	Image/Class	List Entry Label	Target Type	Page
Closing	fa-money	Vouchers Verification	Page in this Application	94
Closing	fa-close	Month Closing	Page in this Application	96
Closing	fa-calendar	Temporary Year End	Page in this Application	93
Closing	fa-calendar-o	Permanent Year End	Page in this Application	97

2.2 Modify/Add Navigation Bar Entries

Having created the menus, the final task in this chapter is to design the Navigation Bar. Go to Shared Components, select the Lists option, and then click Desktop Navigation Bar. This will bring up the default navigation bar carrying the default Logout entry. Click the Create List Entry button to add some more entries by using the settings listed in Table 2-7. By defining a parent entry, the Sign Out entry appears as a submenu item. APP_USER and LOGOUT_URL are built-in substitution strings. APP_USER is the current user running the application, while LOGOUT_URL is an application-level attribute used to identify the logout URL. This is a URL that navigates the user to a logout page or optionally directly logs out a user.

Table 2-7. Navigation Bar Entries

Attribute	New Entry	New Entry	New Entry	Modify Log Out Entry
Parent List Entry	No Parent List Item	No Parent List Item	No Parent List Item	&APP_USER.
Image/Class	fa-mobile	fa-comments	fa-user	
List Entry Label	Mobile	Feedback	&APP_USER.	Sign Out
Target Type	Page in this Application	Page in this Application	No Target	URL
Page	6	300		
Clear Cache		300		
URL Target				&LOGOUT_URL.

Figure 2-1 illustrates the navigation menu and navigation bar of your application.

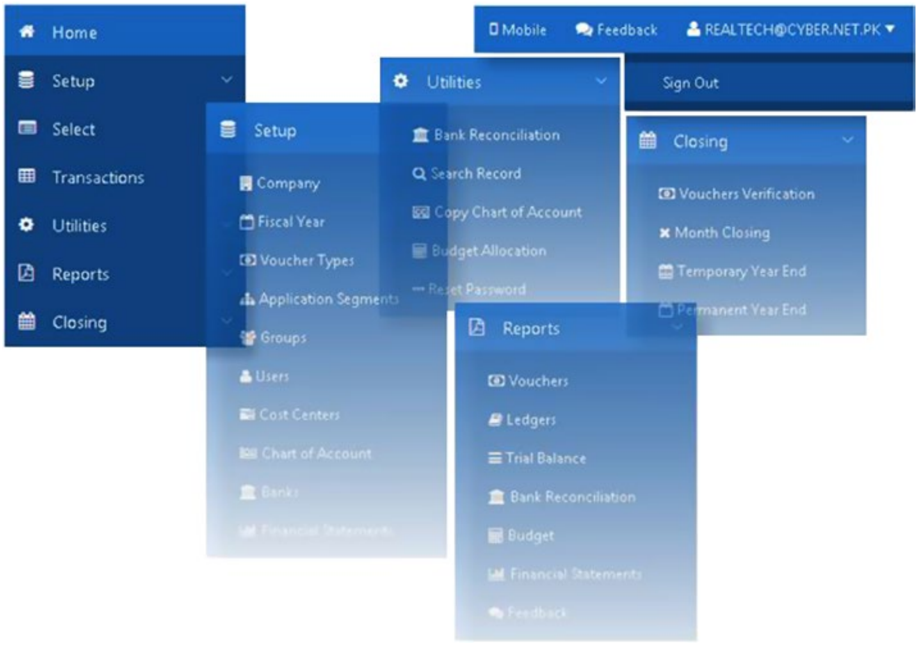


***Figure 2-1.** Navigation menu and navigation bar*

2.3 Summary

This completes the creation of the menus and navigation bar. In subsequent chapters, you will create the application pages that these menu items will connect to. The next chapter describes the creation of the Company Setup page.

CHAPTER 3

Companies

Let’s begin the application-building process by creating the Company Setup, which is very simple. Note that the Home page of your application will contain an executive dashboard that displays various charts based on existing data. Since you do not have any transaction data so far in your database, the Home page will be dealt with in Chapter 29. The Cloud Accountant is capable of handling accounts of multiple companies simultaneously, which is why you have to develop this setup. Each company created through this setup will have a unique code. This code will be saved with every transaction to distinguish one company’s data from that of the others.

3.1 Create Application Tables

Because of the referential integrity constraints used in the tables of this application, I recommend you create all the tables at once using the `script.sql` file provided in the book code. Go to SQL Workshop ➤ SQL Scripts ➤ Upload. Click the Browse button, select the `script.sql` file, and click the Upload button. In SQL Scripts interface, click the Run button to execute the script file. On the Run Script page, click the button labeled Run Now. After successfully executing the script file, go to SQL Workshop ➤ Object Browser and verify the objects.

COMPANIES TABLE AND SEQUENCE

```
CREATE TABLE GL_Company
(Cocode NUMBER, Coname VARCHAR2(50), Coaddress VARCHAR2(100), Cophone
VARCHAR2(15), Cofax VARCHAR2(15), Cocity VARCHAR2(15), Cozip VARCHAR2(15),
Cocurrency VARCHAR2(15), CONSTRAINT gl_company_pk PRIMARY KEY (Cocode) ENABLE)

CREATE SEQUENCE gl_company_seq
```

Note Do not reexecute the `CREATE` statements because you have already created the objects. These statements will be provided at the top of each chapter just for information.

3.2 Create Pages for Company Setup

Use Table 3-1 to create two pages for this setup. On the first wizard page, select Form, and on the next page, select Form on a Table with Report.

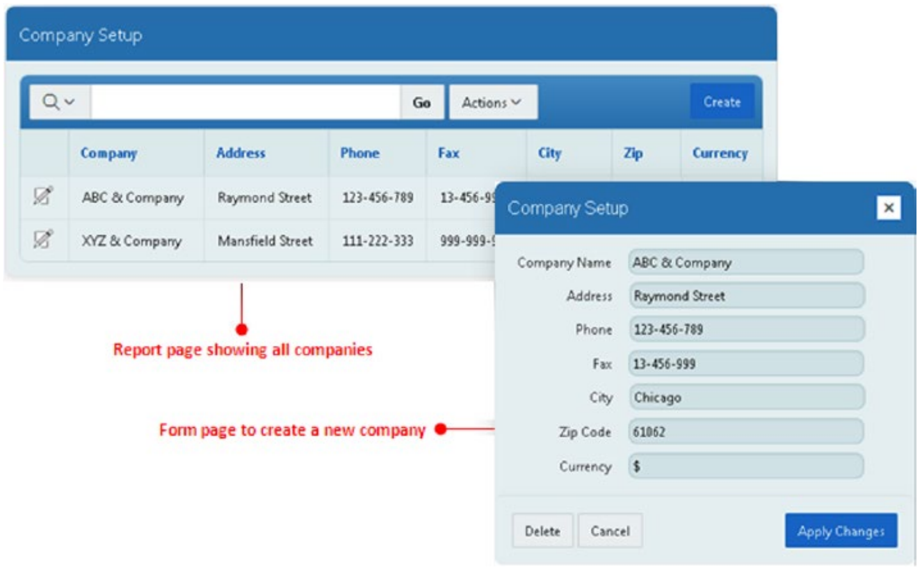
Table 3-1. *Attributes for Two Pages*

Page Type	Attribute	Value
Report Page	Implementation	Interactive
	Page Number	3
	Page Mode	Normal
	Page Name	Company Setup
	Region Title	Company Setup
	Region Template	Standard
	Breadcrumb	- do not add breadcrumb region to page -
	Table/View owner	*Accept the displayed value. It is dependent upon your setup.*
	Table/View Name	GL_COMPANY
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Setup
	Report Columns	Select all columns
	Edit Link Image	*Select any edit link image from the provided options*
	Data Manipulation Process	Insert=Yes, Update=Yes, Delete=Yes
Form Page	Page Number	4
	Page Name	Company Setup
	Page Mode	Modal Dialog
	Region Title	Company Setup
	Region Template	Standard
	Primary Key Type	Select Primary Key Column(s)
	Primary Key Column 1	COCODE
	Source for Primary Key Column 1	Existing Sequence
	Sequence	GL_COMPANY_SEQ
	Form Columns	Select all columns
	Data Manipulation Process	Insert=Yes, Update=Yes, Delete=Yes

---

■ **Note** It is assumed that you have knowledge about all APEX attributes used throughout this book. However, if you are not familiar with any attribute, then click it in the Properties pane and select the Help tab to see its details.

After creation, modify both pages to set appropriate column headings/labels, as shown in Figure 3-1. Run this segment from the Setup ➤ Companies menu and create at least two companies, also shown in Figure 3-1. That's it!


Company Setup
Go
Actions
Create
Report page showing all companies
Form page to create a new company
Company Setup
Delete
Cancel
Apply Changes

	Company	Address	Phone	Fax	City	Zip	Currency
	ABC & Company	Raymond Street	123-456-789	13-456-9			
	XYZ & Company	Mansfield Street	111-222-333	999-999-			

Company Name	ABC & Company
Address	Raymond Street
Phone	123-456-789
Fax	13-456-999
City	Chicago
Zip Code	61062
Currency	$

Figure 3-1. *Creating two companies*

3.3 Summary

In this chapter, you created the simplest setup of your application. The next task in the setup hierarchy is to create financial calendars for these established companies.

CHAPTER 4

Fiscal Year

Organizations are required by law to produce a set of annual accounts. To this end, their general ledger systems must maintain a fiscal calendar. Although the specific start and end dates of a fiscal year vary from country to country, for our purposes the year will start on July 1 and end on June 30. In addition, each fiscal year is normally subdivided into periods. For our purposes, each period will be a calendar month.

FISCAL YEAR TABLE

```
CREATE TABLE gl_fiscal_year
(Cocode NUMBER Constraint fk_fiscal_year References gl_company (Cocode),
Coyear NUMBER(4), Comonthid NUMBER(2), Comonthname VARCHAR2(9), Pfrom DATE,
Pto DATE, Initial_Year NUMBER(1), Year_Closed NUMBER(1),
Month_Closed NUMBER(1), TYE_Executed DATE,
CONSTRAINT gl_fiscal_year_pk PRIMARY KEY (Cocode,Coyear,Comonthid) ENABLE)
```

This setup will use the previous table. Each company's fiscal year will be distinguished by the company code (`cocode`), which references its parent key in the `Company` table. `Coyear` is a numeric field, which will store the year, such as 2015. `Comonthid` is also a numeric column, and it will hold the ID of each month, in other words, from 1 to 12. The first month—in our case July—will be marked as 1. `Comonthname` will store the name of the month, such as September. The two columns, `Pfrom` and `Pto`, will store start and end dates for a month, such as 01-JAN-2015 and 31-JAN-2015. A value of 1 in the `Initial_Year` column signifies that this is the first year of a company; autogeneration of subsequent years will be relative to this initial year. The `Year_Closed` column tags a year as either open or closed. You'll use this column in the year-end processes in Chapter 24. `Month_Closed` is used to indicate that a month is closed to further transactions. The `TYE_Executed` column stores a date value to record when the Temporary Year End process was last executed. Finally, a table-level primary key constraint is defined, comprising three columns, to prevent duplicate values.

R. Ahmed, *Cloud Computing Using Oracle Application Express*,
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4.1 Create List of Values

The next task is to create two lists of values (LOVs) from scratch. These LOVs will be used to populate the Company and Month drop-down lists shown in Figure 4-2 later in this chapter. The query defined in the first LOV displays the names of companies in a select list. The code of the selected company is returned and stored in the corresponding page item (P5_COMPANIES) for further processing. The second LOV returns a static numeric value, which will be used to evaluate the first month of the new fiscal year.

Here is LOV 1:

Attribute	Value
Name	Companies
Type	Dynamic

Query	SELECT coname d, cocode r
	FROM gl_company
	ORDER BY 1

Here is LOV 2:

Attribute	Value	
Name	Months	
Type	Static	
Display & Return Values	**Display Value**	**Return Value**
	January	1
	February	2
	March	3
	April	4
	May	5
	June	6
	July	7
	August	8
	September	9
	October	10
	November	11
	December	12

4.2 Create Page and Parameters Region

Create a blank page, add the components specified in Table 4-1 onto it, and set their relevant attribute values.

■ **Note** Tables similar to the following are used throughout this book to set up and manipulate the application's pages. The Action column displays the action to be taken. For example, the Create Blank Page entry specifies that a blank page is to be created. The Attribute column identifies the attribute for the Blank Page, while the Value column lists the value of each attribute.

Table 4-1. *Component Values*

Action	Attribute	Value
Create Blank Page	Page Number	5
	Name	Fiscal Year Setup
	Page Mode	Normal
	Breadcrumb	- don't use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Setup
Create Region	Title	Parameters
	Type	Static Content
	Template	Standard
Create Page Item	Name	P5_COMPANIES
	Type	Select List
	Label	Companies
	Region	Parameters
	Start New Row	Yes
	Column and Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	List of Values	COMPANIES
	Display Null Value	Yes

(*continued*)

Table 4-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P5_YEAR
	Type	Text Field
	Label	Year
	Region	Parameters
	Start New Row	No
	Column	Automatic
	New Column	Yes
	Column Span	Automatic
	Label Column Span	2
	Template	Required
	Width	4
	Value Required	Yes
	Maximum Length	4
Create Page Item	Name	P5_MONTH
	Type	Select List
	Label	Month
	Region	Parameters
	Start New Row	No
	Column	Automatic
	New Column	Yes
	Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	No
	LOV Type	Shared Component
	List of Values	MONTHS
	Display Null Value	Yes

4.3 Create a Fiscal Year Grid

Next you'll create four regions and a hidden item. The first region (Fiscal Year Setup) is the main region that contains three child regions. It also carries a hidden item (P5_INITIAL_YEAR) to store the value of the Initial_Year column. This value is used in some processes to evaluate the existence of the selected company's fiscal year. The first child region will display the month names, while the other two will show start and end dates for each month. Use Table 4-2 to create these regions, starting with the main region, which is Fiscal Year Setup.

Table 4-2. *Region Values*

Action	Attribute	Value
Create Region	Title	Fiscal Year Setup
	Type	Static Content
	Template	Standard
Create Region	Title	Month
	Type	Static Content
	Parent Region	**Fiscal Year Setup**
	Template	Standard
	Start New Row	Yes
	Column	Automatic
	Column Span	4 *(Uses columns 1–4)*
Create Region	Title	From
	Type	Static Content
	Parent Region	**Fiscal Year Setup**
	Template	Standard
	Start New Row	No
	Column	5
	Column Span	2 *(Uses columns 5 and 6)*
Create Region	Title	To
	Type	Static Content
	Parent Region	**Fiscal Year Setup**
	Template	Standard
	Start New Row	No
	Column	7
	Column Span	2 *(Uses columns 7 and 8)*
Create Page Item	Name	P5_INITIAL_YEAR
	Type	Hidden
	Value Protected	No
	Region	Fiscal Year Setup

Let's spend a moment reviewing the purpose of what you have done so far. To create a fiscal year, you first select a company from the provided list and then manually enter its initial year before choosing the fiscal year's starting month. All of this will be done in the Parameters region. Then, you'll click a button that will execute a process. The process will generate a fiscal year based on the year and month selections. Thereafter, the generated fiscal year will be displayed in additional page items, which you'll create next.

4.4 Add Items to Hold Months/Dates

Now you must add 12 items to each of the three child regions, as listed in Table 4-3. These items will hold month names and the respective first and last dates for each month.

Table 4-3. *Item Values*

Action	Attribute	Value
Create 12 Page Items	Name	P5_MONTH1, P5_MONTH2, ... P5_MONTH12
	Type	Display Only
	Label	1., 2., ... 12.
	Save Session State	No
	Region	Month
	Template	Optional
Create 12 Page Items	Name	P5_FROM1, P5_FROM2, ... P5_FROM12
	Type	Display Only
	Label	*Clear Label*
	Save Session State	No
	Region	From
	Template	Optional
Create 12 Page Items	Name	P5_TO1, P5_TO2, ... P5_TO12
	Type	Display Only
	Label	*Clear Label*
	Save Session State	No
	Region	To
	Template	Optional

4.5 Create Buttons to Generate, Save, and Remove a Fiscal Year

In this section, you will add three buttons using Table 4-4 to the Fiscal Year Setup region to generate, save, and delete a fiscal year. You use JavaScript behind the Delete button to present the delete confirmation box.

Table 4-4. *Button Values*

Action	Attribute	Value
Create Button	Button Name	Generate
	Label	Generate Fiscal Year
	Region	Fiscal Year Setup
	Button Position	Copy
	Hot	Yes
	Action	Submit Page
Create Button	Button Name	Save
	Label	Save
	Region	Fiscal Year Setup
	Button Position	Copy
	Hot	No
	Action	Submit Page
Create Button	Button Name	**Delete**
	Label	Delete
	Region	Fiscal Year Setup
	Button Position	Copy
	Hot	No
	Action	Redirect to URL
	URL Target	javascript:apex.confirm('Delete Fiscal Year?', '**Delete**');
	Execute Validations	Yes *(associated with "4.10 Create Validation: Check Transaction")*

■ **Note** The Delete request defined in JavaScript is case-sensitive and must match the value specified in the Button Name attribute.

In the next section, you'll create the processes that will run each time a button is clicked.

4.6 Generate Fiscal Year Process

After creating a new company, you select it along with its starting fiscal year and month. You then click the Generate button on the page, which automatically generates a complete fiscal year for the company. This automatic generation of the fiscal year is backed by the first of the processes that you are going to add in this section. On the Fiscal Year Setup page, click the Processing tab. Then right-click the Processing node, and select Create Process from the menu. Set the attributes defined in Table 4-5 for this process. You will find the PL/SQL code for this chapter in the `Chapter4` folder.

Table 4-5. *Process Attributes*

Action	Attribute	Value
Create Process	Name	Generate Fiscal Year
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter4\Generate Fiscal Year.txt
	Point	Processing
	When Button Pressed	Generate

■ **Note** The appendix at the end of this book contains all the book code for referencing.

In this PL/SQL block, the financial year runs only from July to June; therefore, no calendar will be generated if the selected month is other than July. You may enhance the code if you want to add other fiscal year combinations. I incremented the year value in December to show the correct year for the months of January to June. I also made provision for leap years in February.

4.7 Save Fiscal Year Process

After generating a fiscal year on the screen, you'll click the Save button, which invokes the process defined in Table 4-6. The process comprises 12 simple insert statements. It collects values from the page items and inserts them into the `GL_FISCAL_YEAR` table. Note that this process and the one that follows will be created under the Generate Fiscal Year process.

Table 4-6. *Save Process*

Action	Attribute	Value
Create Process	Name	Save Fiscal Year
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter4\Save Fiscal Year.txt
	Point	Processing
	Success Message	Fiscal year saved successfully
	When Button Pressed	Save

4.8 Delete Fiscal Year Process

You can also remove erroneously created fiscal years using the process mentioned in Table 4-7 that runs when the delete button is clicked. A year can be deleted only when it passes the Check Transaction validation (see Table 4-9).

Table 4-7. *Delete Process*

Action	Attribute	Value
Create Process	Name	Delete Fiscal Year
	Type	PL/SQL Code
	PL/SQL Code	DELETE FROM gl_fiscal_year WHERE cocode=:P5_COMPANIES AND coyear=:P5_YEAR;
	Point	Processing
	Success Message	Fiscal year deleted successfully
	When Button Pressed	Delete

4.9 Fetch Fiscal Year Dynamic Action

As the name implies, this dynamic action will fetch the initial fiscal year of a company from the database when you select a company from the P5_COMPANIES select list. Click the Dynamic Actions tab, right-click the Change node, and select Create Dynamic Action from the context menu. Set the attributes mentioned in Table 4-8 for the new dynamic action.

Table 4-8. *Action Attributes*

Action	Attribute	Value
Create Dynamic Action	Name	Fetch Fiscal Year
	Event	Change
	Selection Type	Item(s)
	Item(s)	P5_COMPANIES
	Action (under the Show node)	Execute PL/SQL Code
	PL/SQL Code	Book_Code\Chapter4\Fetch Fiscal Year.txt
	Page Items to Submit	P5_COMPANIES
	Page Items to Return	The Fetch Fiscal Year process will retrieve fiscal year values from the database and will return these to the items specified in the Page items to Return attribute. Because it's a long list comprising almost all page items, I created a separate text file for your convenience: Book_Code\Chapter4\Page Items to Return.txt
	Fire On Page Load	No

4.10 Create Validation: Check Transaction

The following validation will check for the existence of data before the deletion of a fiscal year. The delete request will be refused if any record exists in the transactions table. Go to the Processing tab, right-click the Validating node, and select Create Validation. Set the attributes mentioned in Table 4-9 for this validation.

Table 4-9. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Check Transaction
	Type	PL/SQL Function Body (returning Boolean)
	PL/SQL Function Body (returning Boolean)	Book_Code\Chapter4\Check Transaction.txt
	Error Message	Can't delete; transactions exist in this year
	When Button Pressed	Delete

4.11 Create Branch

After deleting a fiscal year, you need to clear the cache. The following branch performs this process. In the Processing tab, right-click the After Processing node, and select Create Branch. Set the attributes mentioned in Table 4-10 for this branch.

Table 4-10. *Branch Attributes*

Action	Attribute	Value
Create Branch	Name	Clear Cache
	Point	After Processing
	Behavior Type	Page or URL (redirect)
	Target Type	Page in this Application
	Page	5
	Clear Cache	5
	When Button Pressed	Delete

4.12 Dynamic Actions to Hide Buttons

After creating a fiscal year, you must hide the Save and Generate buttons and show the Delete button. Similarly, you must hide the Delete button and show the other two when a new fiscal year is being generated. Create the dynamic actions (using Tables 4-11 to 4-19) to achieve these tasks. These dynamic actions will run when a fiscal year for the selected company exists, in other words, when the value of the hidden item P5_INITIAL_YEAR equals 1. Note that this value is retrieved from the database through Fetch Fiscal Year dynamic action, as shown earlier in Table 4-8.

First, you hide the Save button (see Table 4-11).

Table 4-11. *Action: Hide Save Button*

Action	Attribute	Value
Create Dynamic Action	Name	Hide Save Button
	Event	Change
	Selection Type	Item(s)
	Item	P5_INITIAL_YEAR
	Condition	Equal to
	Value	1

Click the Show node under the True node to set the attributes in Table 4-12. These attributes will hide the Save button when the value of P5_INITIAL_YEAR is equal to 1.

Table 4-12. *Action: Hide*

Attribute	Value
Action *(Under Show node)*	Hide
Selection Type	Button
Button	Save
Fire On Page Load	Yes

Now, right-click the False node, and select Create False Action. A new node (Show) will be added, as shown in Figure 4-1.

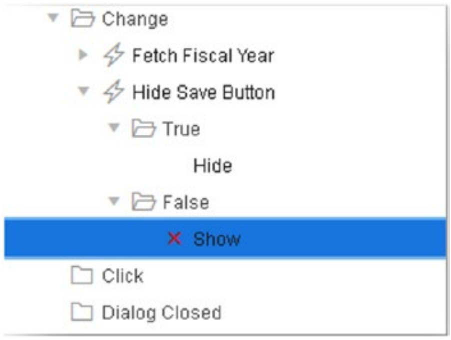


Figure 4-1. *The new node*

Set the attributes in Table 4-13 for the false action to show the Save button when the value of P5_INITIAL_YEAR is NOT equal to 1.

Table 4-13. *Action: Show*

Attribute	Value
Action	Show
Selection Type	Button
Button	Save
Fire On Page Load	Yes

Next you create a dynamic action to hide/show the Generate button (see Table 4-14).

Table 4-14. *Action: Hide Generate Fiscal Year Button*

Action	Attribute	Value
Create Dynamic Action	Name	Hide Generate Fiscal Year Button
	Event	Change
	Selection Type	Item(s)
	Item	P5_INITIAL_YEAR
	Condition	Equal to
	Value	1

Table 4-15 shows the true action attributes.

Table 4-15. *True Action Attributes*

Attribute	Value
Action	Hide
Selection Type	Button
Button	Generate
Fire On Page Load	Yes

Table 4-16 shows the false action attributes.

Table 4-16. *False Action Attributes*

Attribute	Value
Action	Show
Selection Type	Button
Button	Generate
Fire On Page Load	Yes

Finally, create one more dynamic action to hide/show the Delete button, as shown in Table 4-17.

Table 4-17. *Action: Show Delete Button*

Action	Attribute	Value
Create Dynamic Action	Name	Show Delete Button
	Event	Change
	Selection Type	Item(s)
	Item	P5_INITIAL_YEAR
	Condition	Equal to
	Value	1

Table 4-18 shows the true action attributes.

Table 4-18. *Show Attributes*

Attribute	Value
Action	Show
Selection Type	Button
Button	Delete
Fire On Page Load	Yes

Table 4-19 lists the false action attributes.

Table 4-19. *Hide Attributes*

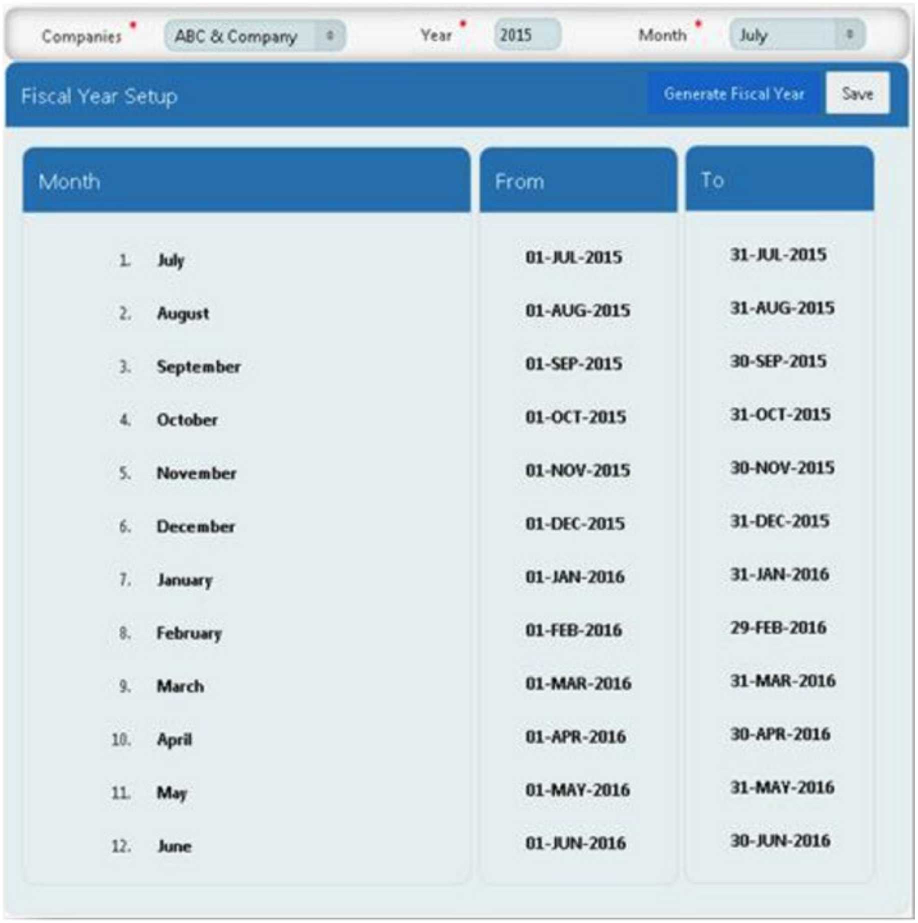
Attribute	Value
Action	Hide
Selection Type	Button
Button	Delete
Fire On Page Load	Yes

4.13 Test Your Work

Save the page and run it from the Setup ➤ Fiscal Year menu. It should look similar to Figure 4-2. Follow these instructions to create a fiscal year for the ABC & Company:

1. Select ABC & Company from the Companies select list.
2. Enter **2015** in the Year box.
3. Select July from the Month select list.

4. Hit the Generate Fiscal Year button. This should display a fiscal year starting from 01-JUL-2015 to 30-JUN-2016. Since 2016 is a leap year, the process adds an extra day onto the month of February.
5. Click the Save button.
6. Repeat steps 2 to 5 to generate a calendar for the other company.



Companies* ABC & Company Year* 2015 Month* July

Fiscal Year Setup

Month	From	To
1. July	01-JUL-2015	31-JUL-2015
2. August	01-AUG-2015	31-AUG-2015
3. September	01-SEP-2015	30-SEP-2015
4. October	01-OCT-2015	31-OCT-2015
5. November	01-NOV-2015	30-NOV-2015
6. December	01-DEC-2015	31-DEC-2015
7. January	01-JAN-2016	31-JAN-2016
8. February	01-FEB-2016	29-FEB-2016
9. March	01-MAR-2016	31-MAR-2016
10. April	01-APR-2016	30-APR-2016
11. May	01-MAY-2016	31-MAY-2016
12. June	01-JUN-2016	30-JUN-2016

Figure 4-2. *Creating a fiscal year*

4.14 Summary

In this chapter, you generated fiscal years for the two companies you created in the previous chapter. Each fiscal year comprises 12 periods, and every transaction you create in the application will be posted in one of these periods. In the next chapter, you will create another application segment called Voucher Types.

CHAPTER 5

Voucher Types

Financial transactions are recorded in ledgers using special forms called *vouchers*. Before creating the actual interface for vouchers, you are going to create a setup page to define different voucher types. Vouchers are broadly divided into three categories: Payment, Receipt, and Journal. Each one has its own specific interface to record transactions. However, in this book, you will create a single interface for all three. By creating this setup, you'll allow the end users to create custom voucher types to distinguish between transactions. Creating this setup is similar to the Company setup described previously. The only difference is the use of Radio Group items that will identify the nature of a voucher type. The database table `GL_VOUCHER` contains a column named `VCHNATURE`. This column holds information about the nature of the vouchers. For example, payment vouchers will be flagged as type 1, receipt vouchers will be marked as type 2, and journal vouchers will be identified as type 3. You will also create a sequence to autogenerate primary key values for the table.

VOUCHER TYPES TABLE AND SEQUENCE

```
CREATE TABLE gl_voucher
(Vchcode NUMBER, Vchtype VARCHAR2(6), Vchtitle VARCHAR2(30), Vchnature
NUMBER(1),
 CONSTRAINT GL_VOUCHER_PK PRIMARY KEY (Vchcode) ENABLE)

CREATE SEQUENCE gl_voucher_seq
```

5.1 Create List of Values

Create a list of values from scratch. This LOV will be linked to the voucher nature radio item. Set the Name attribute of this LOV to Voucher Nature, and set Type to Static. Set display and return values, as defined in Table 5-1.

Table 5-1. *Voucher Nature List of Values*

Display Value	Return Value
PV	1
RV	2
JV	3

5.2 Create Pages for Voucher Types Setup

Create a new page by selecting the Form and Form on a Table with Report options in the page creation wizard. Set the attributes for the two pages as shown in Table 5-2.

Table 5-2. *Page Attributes*

Page Type	Attribute	Value
Report Page	Implementation	Interactive
	Page Number	7
	Page Mode	Normal
	Page Name	Voucher Types Report
	Region Title	Voucher Types
	Region Template	Standard
	Breadcrumb	- do not add breadcrumb region to page -
	Table/View owner	*Accept the displayed value*
	Table/View Name	GL_VOUCHER
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Setup
	Report Columns	*Select all the columns to include in the report page*
	Edit Link Image	*Select any edit link image from the provided options*

(*continued*)

Table 5-2. *(continued)*

Page Type	Attribute	Value
Form Page	Page Number	8
	Page Name	Voucher Types Form
	Page Mode	Modal Dialog
	Region Title	Enter New Voucher Type
	Region Template	Standard
	Primary Key Type	Select Primary Key Column(s)
	Primary Key Column 1	VCHCODE
	Source for Primary Key Column 1	Existing Sequence
	Sequence	GL_VOUCHER_SEQ
	Form Columns	*Select all the columns to include in the form page*
	Data Manipulation Process	Insert=Yes, Update=Yes, Delete=Yes

After creation, modify the attributes on page 8 so they match Table 5-3.

Table 5-3. *Page 8 Attributes*

Action	Attribute	Value
Modify Page Items	Name	P8_VCHTYPE
	Label	Type
	Template	Required
	Value Required	Yes
	Name	P8_VCHTITLE
	Label	Title
	Template	Required
	Value Required	Yes

5.2.1 Convert Text Item to Radio Group

The final task of this setup is to covert the page item representing the `VCHNATURE` column from a text item to a radio group. Click the P8_VCHNATURE page item, and set the attributes defined in Table 5-4.

Table 5-4. *VCHNATURE Attributes*

Attribute	Value
Type	Radio Group
Label	Nature
Number of Columns	3
Template	Required
Value Required	Yes
LOV Type	Shared Component
List of Values	VOUCHER NATURE
Display Extra Value	No
Display Null Value	No
Default Type	Static Value
Static Value	3 (i.e. JV)

5.3 Create Validation: Check Transaction

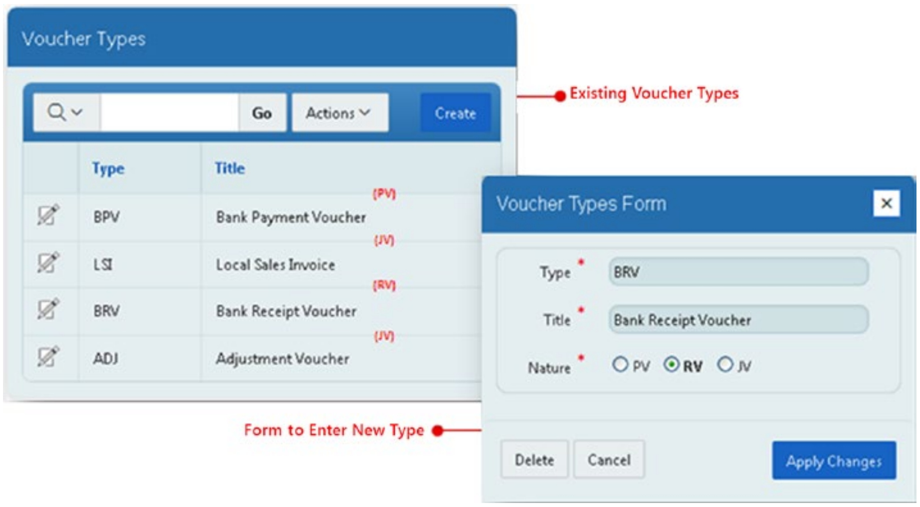
Create a validation to prevent the deletion of voucher types with generated transactions. Select the Processing tab, right-click the Validating node, and then click the Create Validation option in the context menu. Now set the attributes of this validation as mentioned in Table 5-5.

Table 5-5. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Check Transaction
	Type	PL/SQL Function Body (returning Boolean)
	PL/SQL Function Body Returning Boolean	Book_Code\Chapter5\Check Transaction.txt
	Error Message	Can't delete voucher type with generated transactions
	When Button Pressed	DELETE

5.4 Test Your Work

Add the appropriate labels for the columns on both forms, as shown in Figure 5-1. Save the page and run this feature from the Setup | Voucher Types menu. Create the three voucher types as illustrated in the title picture. Voucher types having cash or a bank involved must be of a Payment (PV) or Receipt (RV) nature; all other types can be assigned to the Journal (JV) nature.



Type	Title	
BPV	Bank Payment Voucher	(PV)
LSI	Local Sales Invoice	(JV)
BRV	Bank Receipt Voucher	(RV)
ADJ	Adjustment Voucher	(JV)

Type *	BRV
Title *	Bank Receipt Voucher
Nature *	PV [✓ RV] JV

Figure 5-1. *Labels for the columns on both forms*

5.5 Summary

By adding this setup, you allow users to create custom voucher types to distinguish financial transactions according to their nature. The GL application consists of various segments that will be used in a multiuser environment. To control user access to these segments, you will create a strong security module. But first you have to identify and store those segments in the database, which is the topic of the next chapter.

CHAPTER 6

Application Segments

In this chapter, you will create a setup that provides a list of all the different parts of the application. Just like a site map created for web sites, it is displayed as a tree view of the application and is created to implement application security. There are three main components in the application that you should apply security to: Menus (including the main and submenus), Pages, and Items (such as buttons). The fourth one (App) is called the root node and is used to distinguish between segments of multiple applications. After creating all the application segments here, you will use them in the next chapter to enforce application access rules. It's a flexible module, which is designed in such a way to accommodate future application enhancements.

SEGMENTS TABLE AND SEQUENCE

```
CREATE TABLE gl_segments
(segmentID NUMBER, segmentTitle VARCHAR2(50), segmentParent NUMBER,
segmentType VARCHAR2(4),
pageID NUMBER(4), itemRole VARCHAR2(10), CONSTRAINT gl_segments_pk PRIMARY
KEY (segmentID) ENABLE)

CREATE SEQUENCE gl_segments_seq MINVALUE 1 START WITH 1 INCREMENT
BY 1 CACHE 20
```

Each application segment will be stored in this table with a unique ID (`segmentID`). To present these segments in a hierarchal format, the `segmentParent` column will store the ID of each segment's parent. Each entry in this table will have a type that will be stored in the `segmentType` column. The `pageID` column will be stored with each segment to identify its location. The `itemRole` column specifies the role of page items (buttons and select lists). For example, the create button on a page performs the role of record creation, so the Create role will be assigned to this button.

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6.1 Create LOVs

Create two static LOVs from scratch using Tables 6-1 and 6-2. The values included in these LOVs will be utilized in the segment creation form to identify the type of segments and the roles performed by page items.

Table 6-1. *LOV Name: Segment Type*

Display Value	Return Value
App	App
Item	Item
Menu	Menu
Page	Page

Table 6-2. *LOV Name: Item Role*

Display Value	Return Value
Create	Create
Modify	Modify
Delete	Delete
Save	Save
Print	Print
Display	Display

6.2 Create Segments Setup Pages

Use Table 6-3 to create two pages. On the first wizard page, select the Form option followed by Form on a Table with Report.

Table 6-3. *Segments Setup Pages*

Page Type	Attribute	Value
Report Page	Implementation	Interactive
	Page Number	19
	Page Mode	Normal
	Page Name	Application Segments Report
	Region Title	Application Segments
	Region Template	Standard
	Breadcrumb	- do not add breadcrumb region to page -
	Table/View owner	*Accept the displayed value*
	Table/View Name	GL_SEGMENTS
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Setup
	Report Columns	*Select all the columns to include in the report page*
	Edit Link Image	*Select any edit link image from the provided options*
Form Page	Page Number	20
	Page Name	Application Segments Form
	Page Mode	Modal Dialog
	Region Title	Application Segment
	Region Template	Standard
	Primary Key Type	Select Primary Key Column(s)
	Primary Key Column 1	SEGMENTID
	Source for Primary Key Column 1	Existing Sequence
	Sequence	GL_SEGMENTS_SEQ
	Form Columns	*Select all the columns to include in the form page*
	Data Manipulation Process	Insert=Yes, Update=Yes, Delete=Yes

After creation, modify the form page (page 20) to change the item labels, as shown in Figure 6-1.

6.3 Modify Segments Form

Amend the Application Segments form's items as indicated in Table 6-4. The P20_SEGMENTPARENT item is being transformed into a pop-up LOV. It will display title and type columns from the segments table to allow the selection of a parent for a new entry. Since the Item segment type doesn't have any children, the LOV will exclude these records.

Table 6-4. *Application Segments Form Attributes*

Action	Attribute	Value
Modify Items	Names	P20_SEGMENTTITLE, P20_SEGMENTPARENT & P20_SEGMENTTYPE
	Template	Required
	Value Required	Yes
Modify Item	Name	P20_SEGMENTPARENT
	Type	Popup LOV
	Type (LOV)	SQL Query

	SQL Query	SELECT segmentTitle||' ('||segmentType||')' d, segmentID r
		FROM gl_segments
		WHERE segmentType != '**Item**'
		ORDER BY pageID,segmentID,segmentParent

	Default Type	Static Value
	Static Value	0
Modify Item	Name	P20_SEGMENTTYPE
	Type	Select List
	LOV Type	Shared Component
	List of Values	SEGMENT TYPE
Modify Item	Name	P20_PAGEID
	Width	4
	Maximum Length	4
Modify Item	Name	P20_ITEMROLE
	Type	Select List
	LOV Type	Shared Component
	List of Values	ITEM ROLE

6.4 Add Tree View Region

Currently, the report page (19) contains an interactive report region to display all segments in a matrix report. In this section, you will change this appearance to display all the segments in a tree view, as shown in Figure 6-1. First, delete the existing Application Segments region from page 19 and then add a new region to this page using the attributes shown in Table 6-5.

Table 6-5. *Tree View Region Attributes*

Attribute	Value
Title	Application Segments
Type	Tree
SQL Query	Book_Code\Chapter6\Tree Query.txt
Template	Standard

6.5 Create Buttons

Right-click the new Application Segments tree region and select Create Button from the context menu. Set the attributes for this button, as shown in Table 6-6. This button will be used to create a new application segment.

Table 6-6. *Create Button Attributes*

Attribute	Value
Button Name	Create
Label	Create
Region	Application Segments
Button Position	Copy
Hot	Yes
Action	Redirect to Page in this Application

Target	Type = Page In This Application
	Page = 20
	Clear Cache = 20

Create another button named Refresh using the attributes indicated in Table 6-7. This button is added to refresh the segments tree.

Table 6-7. *Refresh Button Attributes*

Attribute	Value
Button Name	Refresh
Label	Refresh
Region	Application Segments
Button Position	Copy
Button Template	Text with Icon
Hot	No
Icon CSS Classes	fa-undo
Action	Redirect to Page in this Application

Target	Type = Page In This Application
	Page = &APP_PAGE_ID.

6.6 Create Validations

Using the Table 6-8, create two validations on page 20 to prevent the deletion of used segments.

Table 6-8. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Check Segment
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function Body Returning Error Text	Book_Code\Chapter5\Check Segment.txt
	Error Message	Cannot delete a utilized segment
	When Button Pressed	DELETE
Create Validation	Name	Check Child Segment
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function Body Returning Error Text	Book_Code\Chapter5\Check Child Segment.txt
	Error Message	Cannot delete, this segment has child entries
	When Button Pressed	DELETE

6.7 Create Branch

After clicking the Create button on the Application Segments form page, you will get a message indicating that your action was processed successfully, but you'll notice that the values still exist on the form. To create uninterrupted records in a blank form, create a branch under the After Processing node and set the attributes specified in Table 6-9.

Table 6-9. *Branch Attributes*

Action	Attribute	Value
Create Branch	Name	Clear Page 20
	Point	After Processing
	Behavior Type	Page or URL (Redirect)

	Target	Type = Page In This Application
		Page = 20
		Clear Cache = 20

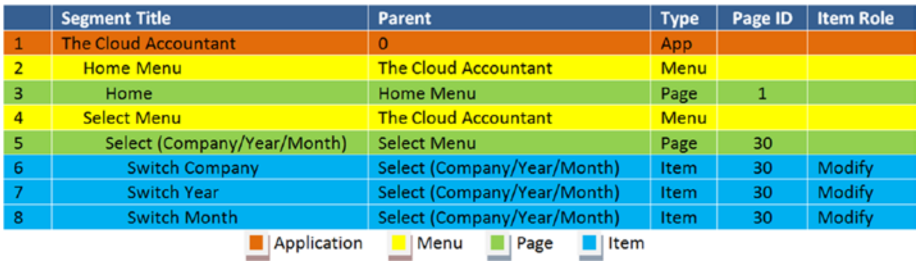
	When Button Pressed	CREATE

One more thing that you must do in order to stay on page 20 is to remove the CREATE button value from the request specified in the Close Dialog process. In the Processing tab, click the Close Dialog process. Scroll down to the Condition section in the properties editor, and remove the CREATE entry from the Value list. By default, the modal page is closed when Create, Save, or Delete buttons are clicked. By removing the CREATE entry, the dialog page will be closed only when the Save (labeled Apply Changes) or Delete buttons are clicked. This way you will stay on page 20 to create additional segment records.

6.8 Test Your Work

Everything is set! Now it is the time to test your work. Save your work and run the Application Segments module from the Setup menu. Click the Create button, and enter the records mentioned in Table 6-10 one after the other in the segments form.

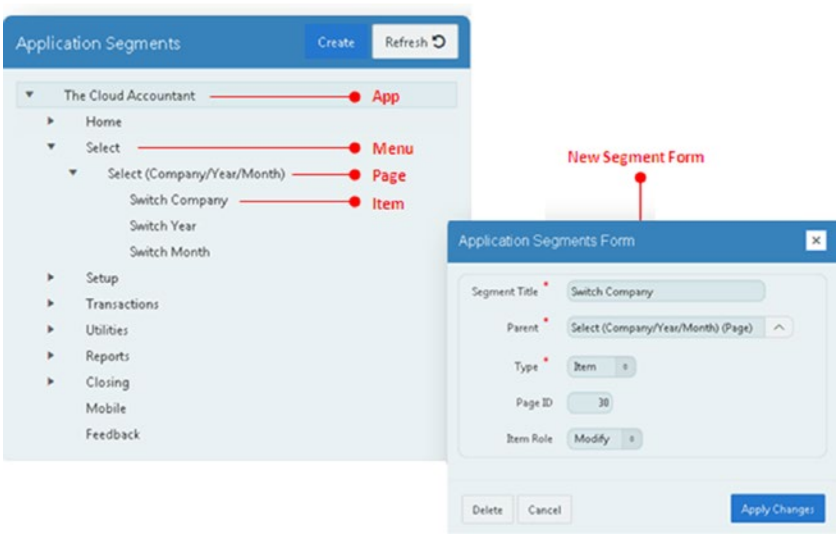
Table 6-10. *List of Application Segments*



	Segment Title	Parent	Type	Page ID	Item Role
1	The Cloud Accountant	0	App		
2	Home Menu	The Cloud Accountant	Menu		
3	Home	Home Menu	Page	1	
4	Select Menu	The Cloud Accountant	Menu		
5	Select (Company/Year/Month)	Select Menu	Page	30	
6	Switch Company	Select (Company/Year/Month)	Item	30	Modify
7	Switch Year	Select (Company/Year/Month)	Item	30	Modify
8	Switch Month	Select (Company/Year/Month)	Item	30	Modify

🟧 Application 🟨 Menu 🟩 Page 🟦 Item

The first entry in Table 6-10 will create the application root; therefore, no parent is assigned to it. Recall that you assigned the default value (zero) for the parent item in Table 6-4. The second and fourth main menu entries will come under the application root. The first page entry defined in line 3 will be placed under the Home menu, along with the corresponding page number. Similarly, the Select page defined in line 5 will come under the Select menu. The last level of your application hierarchy belongs to page items (lines 6–8). The Select page (30) will have three select lists (Company, Year, and Month), so these items are set under page 30. If you mark the Type of an entry as an Item, then you must also specify its role. Roles will be used in Chapter 32 to implement application security. The list in Table 6-10 is a subset of a comprehensive list that covers all of the application's segments. You can find the complete list in the `application_segments.xlsx` file in the book code's Chapter 6 folder. Open it up and add all application segments to complete this chapter. Note that it is not necessary to follow the defined sequence while creating new segments; you can add an entry to any level, any time. The important thing is to select the correct parent to place the new entry under. Figure 6-1 provides an overview of the two Application Segments pages.



Segment Title *	Switch Company
Parent *	Select (Company/Year/Month) (Page)
Type *	Item
Page ID	30
Item Role	Modify

Figure 6-1. *Segments pages*

6.9 Summary

In this chapter, you created a hierarchy of your application segments that will be used to control application access in the next chapter.

CHAPTER 7

User Groups

In the previous chapter, you laid the foundation of your application's security that will be imposed on menus, pages, and page items. In this chapter, you will create user groups. Allocating application rights to individual users is a tedious activity, and it's not recommended because it is highly error-prone. You create a few user groups and assign application privileges to them instead. Users are created afterward and then associated with their respective groups. This means all users inherit application rights from the group (or groups) to which they belong. For example, to handle application security for a staff of more than 100 employees, comprising managers and data entry clerks, you will create just two groups (Managers and Clerks) with appropriate privileges. Any changes made to the privileges of these groups will be automatically inherited by all associated users.

USER GROUPS TABLES

```
CREATE TABLE gl_groups_master
(groupID NUMBER(4), groupTitle VARCHAR2(25), CONSTRAINT gl_groups_pk PRIMARY
KEY (groupID) ENABLE)

CREATE TABLE gl_groups_detail
(groupID NUMBER(4) CONSTRAINT fk_Group_Detail REFERENCES gl_groups_
master(groupID), segmentID NUMBER CONSTRAINT fk_user_groups REFERENCES gl_
segments(segmentID), segmentParent NUMBER, segmentType VARCHAR2(4), pageID
NUMBER(4), itemRole VARCHAR2(10), allow_access VARCHAR2(1))
```

In this setup, you will be using two tables. The master table will hold IDs and titles of groups, while the details table will contain all application privileges (specified in the segments setup) for each group.

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7.1 Page and Parameters Region

You will set up user groups using just one application page. This page will carry two main regions: Parameters and Group's Privileges. In the Parameters region, you indicate whether you are creating a new group or are manipulating an existing one. Based on this selection, you'll be provided with the appropriate interface. For example, if you're trying to modify or delete an existing group, then you'll select the Existing option, followed by a group from the provided list. When you select the New option, a different interface will be presented to allow you to create a new group. Just like the Financial Year setup, you'll start by creating a blank page for this setup. Use Table 7-1 to add a blank page and other components to the page.

Table 7-1. *Page and Parameters Region Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	21
	Name	User Groups
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Setup
Create Region	Title	Parameters
	Type	Static Content
	Template	Standard

(*continued*)

Table 7-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P21_EXISTINGNEW
	Type	Radio Group
	Label	Action:
	Number of Columns	2
	Page Action on Selection	Submit Page (*to show/hide Group's Privileges region*)
	Region	Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	1
	Template	Required
	Type (LOV)	Static Values
	Static Values	STATIC:New;NEW,Existing;EXISTING
	Display Null Value	No
	Type (Default)	Static Value
	Static Value	EXISTING

(*continued*)

Table 7-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P21_GROUPID1
	Type	Select List
	Label	Group:
	Page Action on Selection	Submit Page (*to refresh Selected Segment region*)
	Region	Parameters
	Start New Row	No
	Column/Column Span	4/5
	LOV Type	SQL Query
	SQL Query	SELECT DISTINCT groupTitle d, groupID r FROM gl_groups_master ORDER BY groupID
	Type (Condition)	Item = Value
	Item	P21_EXISTINGNEW
	Value	EXISTING (*the list is displayed only when EXISTING option is on*)
Create Page Item	Name	P21_GROUPTITLE1 (*used in the Tree region's title*)
	Type	Hidden
	Region	Parameters
	Type (Source)	SQL Query (return single value)
	SQL Query	SELECT groupTitle FROM gl_groups_master WHERE groupID=:P21_ GROUPID1
	Source Used	Always, replacing any existing value in session state

(*continued*)

Table 7-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P21_GROUPID2 (*to assign a new ID to a new group*)
	Type	Display Only
	Label	<b>Group ID:</b>
	Region	Parameters
	Start New Row	No
	Column	4
	Column Span	2
	Type (Source)	SQL Query (return single value)
	SQL Query	SELECT MAX(groupID)+1 FROM gl_groups_master
	Source Used	Always, replacing any existing value in session state
	Type (Default)	Static Value
	Static Value	1
	Type (Condition)	Item = Value
	Item	P21_EXISTINGNEW
	Value	NEW
Create Page Item	Name	P21_GROUPTITLE2 (*title for a new group*)
	Type	Text Field
	Label	<b>Title:</b>
	Region	Parameters
	Start New Row	No
	Column	Automatic
	New Column	Yes
	Column Span	Automatic
	Type (Condition)	Item = Value
	Item	P21_EXISTINGNEW
	Value	NEW

■ **Note** The two items (P21_GROUPID2 and P21_GROUPTITLE2) are displayed only when the NEW option is on. Make sure that the Value attribute NEW doesn't have any leading or trailing blanks.

7.2 Buttons

Add two buttons to the Parameters region, as mentioned in Table 7-2. These buttons will be displayed on the new group creation form. Clicking the Create Group - Allow All button will create a group with all the application access privileges, while clicking the Create Group - Disallow All button will create a group without any privileges.

Table 7-2. *Button Attributes*

Attribute	Button 1	Button 2
Name	Allow	Disallow
Label	Create Group - Allow All	Create Group - Disallow All
Region	Parameters	Parameters
Button Position	Create	Create
Action	Submit Page	Submit Page
Type (Condition)	Item = Value	Item = Value
Item	P21_EXISTINGNEW	P21_EXISTINGNEW
Value	NEW	NEW

7.3 New Group Process

This process is associated with the two buttons created in the previous section. The condition says that if the request came from any of the two buttons, then execute the PL/SQL process to create the group with all or no privileges. Under the Processing tab, right-click the Processing node and choose Create Process to create a new process, as specified in Table 7-3.

Table 7-3. *New Group Process Attributes*

Action	Attribute	Value
Create Process	Name	Create New Group
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter7\Create New Group.txt
	Point	Processing
	Success Message	Group Created Successfully
	Error Message	Could not create group
	Type (Condition)	Request is contained in Value
	Value	Allow,Disallow *(Case Sensitive, should match with the button names provided above)*

7.4 Delete Group Button

Create a button (as mentioned in Table 7-4) to delete an existing group. When you submit the page through this button, the process Delete Group (created next) is executed.

Table 7-4. *Delete Group Button Attributes*

Action	Attribute	Value
Create Button	Name	Delete
	Label	Delete Group
	Region	Parameters
	Button Position	Create
	Hot	Yes
	Action	Submit Page
	Type (Condition)	Item = Value
	Item	P21_EXISTINGNEW
	Value	EXISTING

7.5 Delete Group Process

Create a new process (as specified in Table 7-5) to drop a group. This process will execute only when the user selects a group from the select list, in other words, when the value of the page item P21_GROUPID1 is not zero. Note that the GL_USERS table already has a constraint to avoid the deletion of a group with associated users.

Table 7-5. *Delete Group Process Attributes*

Action	Attribute	Value
Create Process	Name	Delete Group
	Type	PL/SQL Code
	PL/SQL Code	DELETE FROM gl_ groups_detail WHERE groupID=:P21_GroupID1; DELETE FROM gl_ groups_master WHERE groupID=:P21_GroupID1;
	Point	Processing
	Success Message	Group Deleted Successfully
	Error Message	Could not delete group
	When Button Pressed	Delete
	Type (Condition)	Item is NOT NULL and NOT zero
	Item	P21_GROUPID1

7.6 Group Privileges Region

This is another static content region that will carry tree and classic report regions to display the application access privileges of a selected group. The region will be displayed only when you select the EXISTING option from the radio group. Use Table 7-6 to create this region.

Table 7-6. *Group Privileges Region Attributes*

Action	Attribute	Value
Create Region	Title	Group's Privileges
	Type	Static Content
	Type (Condition)	Item = Value
	Item	P21_EXISTINGNEW
	Value	EXISTING

7.7 Tree Region

Add a tree region to the Group's Privileges region (using Table 7-7) to display the application access rights of the selected group. The query used for this tree is similar to the one used in Chapter 6, except for the link column, which uses the inline JavaScript call `'javascript:pageItemName('||apex_escape.js_literal(segmentid)||')' As link` to a function named `pageItemName`, defined in Table 7-7. The `APEX_ESCAPE` package provides functions for escaping special characters in strings to ensure that the data is suitable for further processing. The `JS_LITERAL` function, of the `APEX_ESCAPE` package, escapes and optionally enquotes a JavaScript string.

The function (`pageItemName`) is called in the tree's query link. The calling procedure (in the query) passes a segment ID to the function's `selectedNode` parameter. The `$s` (which is a JavaScript function) sets the value of a hidden page item (P21_SELECTED_NODE) to the value received in the `selectedNode` parameter, which is then used to refresh another region (Selected Segment) to display the relevant segment along with its access privilege.

Table 7-7. *Tree Region Attributes*

Action	Attribute	Value
Create Region	Title	Group: &P21_GROUPTITLE1.
	Type	Tree
	SQL Query	Book_Code\Chapter7\Tree Query.txt
	Parent Region	Group's Privileges
	Select Node Page Item (Under Attributes)	P21_SELECTED_NODE (*to save the Tree state*)
Create Page Item	Name	P21_SELECTED_NODE
	Type	Hidden
	Value Protected	No
	Region	Group: &P21_GROUPTITLE1.

Modify Page 21	Function and Global Variable Declaration *(Click on the root node - Page 21: User Groups - to enter this code)*	function pageItemName(selectedNode)
		{
		  $s('P21_SELECTED_NODE', selectedNode);
		}

7.8 Add Classic Report Region

This report will show the name of the selected segment, along with its access privilege. A button will also be added to this region to allow/revoke the access right. The report is presented using a query that is based on the value of the hidden item, which P21_SELECTED_NODE. Set the attributes as indicated in Table 7-8 for this region.

Table 7-8. *Classic Report Region Attributes*

Action	Attribute	Value
Create Region	Title	Selected Segment
	Type	Classic Report
	SQL Query	SELECT s.segmentTitle,g.allow_access FROM gl_segments s, gl_groups_detail g WHERE s.segmentID=:P21_SELECTED_NODE AND s.segmentID=g.segmentID AND g.groupID=:P21_GROUPID1
	Page Items to Submit	P21_SELECTED_NODE
	Parent Region	Group's Privileges
	Start New Row	No
	Type (Condition)	Item = Value
	Item	P21_EXISTINGNEW
	Value	EXISTING

7.9 Dynamic Action to Refresh Region

You also need to refresh the classic report region (Selected Segment) with the appropriate data when the user switches from one tree node to another. The dynamic action mentioned in Table 7-9 serves this purpose. Create this dynamic action under the Change node.

Table 7-9. *Dynamic Action to Refresh Region*

Action	Attribute	Value
Create Dynamic Action	Name	Refresh Region
	Event	Change
	Selection Type	Item(s)
	Item(s)	P21_SELECTED_NODE
	Action *(under Show node)*	Refresh
	Selection Type	Region
	Region	Selected Segment

7.10 Add Button and a Process to Allow/Revoke Segment Access Right

This button will appear in the Selected Segment report region. When clicked, it will invoke the associated process to either allow or revoke access privilege to or from the selected group. Use Table 7-10 to create the button and the corresponding process.

Table 7-10. *Button and Process Attributes*

Action	Attribute	Value
Create Button	Name	Allow/Revoke
	Label	Allow/Revoke
	Region	Selected Segment
	Button Position	Next
	Hot	Yes
	Action	Submit Page
Add Page Process	Name	Update Allow_Access Column
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter7\Allow Access.txt
	Point	Processing
	When Button Pressed	Allow/Revoke

7.11 Test Your Work

Execute the following steps to test your work:

1. Save your work and execute the module from the Setup ➤ User Groups menu. The page resembling Figure 7-1 should come up.

2. Click the New option in the Parameters pane.

3. Enter a title for the new group. For example, enter **Admins**.

4. Click the button Create Group - Allow All. This should create the Admins group with all application privileges.

5. Click the Existing option, and select Admins from the select list. Click different tree nodes and watch the changes in the right pane.

   Click the Allow/Revoke button and note the immediate reflection.

   The value *Y* in the Allow Access column says that the selected group has the access privilege on the selected segment.

6. Add two more groups. Name the first one **Managers** and the second one as **Clerks**. Create the Managers group using the Create Group - Allow All button. Create the Clerks group using the Create Group - Disallow All button.

■ **Note** Sometimes when you click a segment node you do not see anything in the Selected Segment region; this happens when you forget to select a group from the select list.

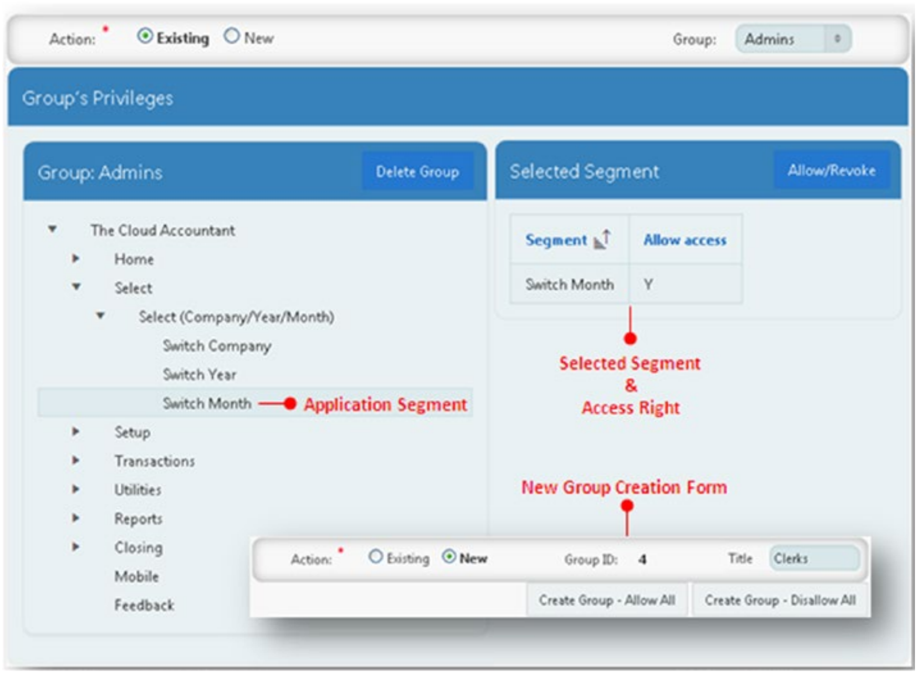

Figure 7-1. *Group's Privileges page*

7.12 Summary

You've successfully set up the application access privileges, but these privileges are not yet implemented. This is because the application is in the development phase and only after its completion will you be in a position to completely deploy the security module, which will be done in Chapter 32. In the next chapter, you will create a setup to add accounts of the application users.

CHAPTER 8

Create Users

After creating groups, you add users to them, as shown in Figure 8-1 later in this chapter. You input a user ID for each new user, but when you call up an existing user's record for modification, this value is displayed as read-only text. You also allocate a default company to each new user to work in. This allocation is helpful in restricting a user to handling the accounts of a specific company. You might notice from Figure 8-1 that besides assigning the Admins group, you also specify whether the user is an administrator. This is because you have a column (`Admin`) in the `GL_USERS` table that explicitly assigns administrative rights to those users marked as administrators, irrespective of the group to which they belong. This explicit marking is necessary in some cases to quickly assess whether a user is an administrator. You'll see an instance of this in the next chapter.

USERS TABLE

```
CREATE TABLE gl_users
(userID VARCHAR2(50), cocode NUMBER CONSTRAINT fk_users REFERENCES gl_
company (Cocode), coyear NUMBER(4), comonthid NUMBER(2), groupID NUMBER(4)
CONSTRAINT fk_users2 REFERENCES gl_groups_master(groupID),
password VARCHAR2(4000), admin VARCHAR2(1), CONSTRAINT gl_users_pk PRIMARY
KEY (userID) ENABLE)
```

Besides their usual credentials, this table will store company, year, and month information for each user. This information will be displayed through the Global Page on every application page so that users will know where their transactions are going to be saved. For more details, see Chapter 10.

8.1 Create Pages

Select the Form option followed by Form on a Table with Report to create Report and Form pages, as mentioned in Table 8-1.

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Table 8-1. *Report and Form Page Attributes*

Page Type	Attribute	Value
Report Page	Implementation	Interactive
	Page Number	22
	Page Mode	Normal
	Page Name	Users Report
	Region Title	Application Users
	Region Template	Standard
	Breadcrumb	- do not add breadcrumb region to page -
	Table/View owner	*Accept the displayed value*
	Table/View Name	GL_USERS
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Setup
	Report Columns	Select all columns
	Edit Link Image	*Select any edit link image from the provided options*
Form Page	Page Number	23
	Page Name	User Form
	Page Mode	Modal Dialog
	Region Title	Application User
	Region Template	Standard
	Primary Key Type	Managed by Database (ROWID)
	Form Columns	Select three columns: USERID, GROUPID, and ADMIN
	Data Manipulation Process	Insert=Yes, Update=Yes, Delete=Yes

After creation, modify both these pages to set the attributes listed in Table 8-2. The default query in the source SQL query is replaced with a custom join query, which fetches users' records from multiple tables.

Table 8-2. *Modified Page Attributes*

Action	Attribute	Value
Modify Region on Users Report Page	Region	Application Users
	SQL Query	Book_Code\Chapter8\SQL Query.txt
Modify Region on User Form Page	Region	Application User
	Title	Application User: &P23_USERID.

8.2 Create/Modify Items

Add and amend the items on page 23 using Table 8-3. The first item (Display Only) is added (between two existing items: User ID and Group ID) to show the ID of the selected user as read-only text. The condition for this item is set so that it will display only when you call a record of an existing user for modification. The opposite condition is set for the item P23_USERID to make it visible only for new records.

Table 8-3. *Create/Modify Items*

Action	Attribute	Value
Create Page Item	Item Name	P23_USERID2
	Type	Display Only
	Label	<b>User ID:</b>
	Sequence	25 *(between UserID and GroupID)*
	Source Type	Database Column
	Column Name	USERID
	Condition Type	Item Is NOT NULL
	Item	P23_USERID
Modify Item	Item Name	P23_USERID
	Label	<b>User ID:</b>
	Value Placeholder	Enter in UPPER CASE
	Condition Type	Item is NULL
	Item	P23_USERID

(*continued*)

Table 8-3. (*continued*)

Action	Attribute	Value
Modify Item	Item Name	P23_GROUPID
	Type	Select List
	Label	<b>Group:</b>
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	SELECT groupTitle d, groupID r FROM gl_groups_master
Modify Item	Item Name	P23_ADMIN
	Type	Radio Group
	Label	<b>Administrator:</b>
	No. of Columns	2
	LOV Type	Static Values
	Static Values	STATIC:Yes;Y,No;N
	Display Null Value	No
	Default Type	Static Value
	Static Value	N
Create Page Item	Item Name	P23_COMPANY
	Type	Select List
	Label	<b>Default Company:</b>
	Region	Application User: &P23_USERID.
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	List of Values	COMPANIES
	Source Type	Null

8.3 Create a Process to Set Company, Year, and Month

The process mentioned in Table 8-4 will be executed when either the CREATE or the APPLY CHANGES buttons are clicked on page 23. The process is added to fill in values for the company, year, and month columns based on the default company that is selected for a user. Create this process under the Processes node and place it just after the first process named Process Row of GL_USERS. If you place it in the last position, it won't execute because of the preceding Close Dialog process, which will execute before this process and will close the page.

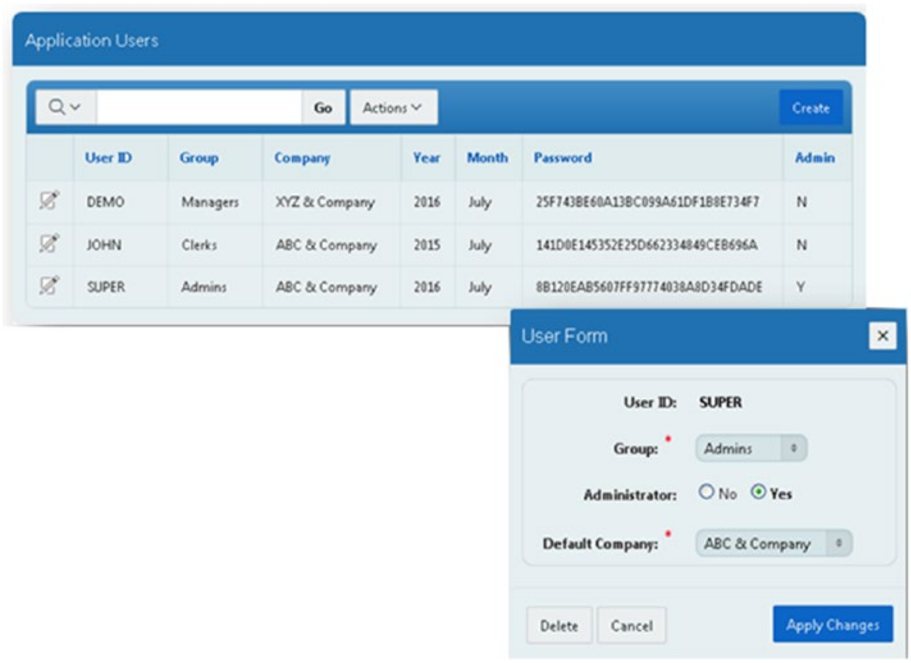
Table 8-4. *Process Attributes*

Action	Attribute	Value
Create Process	Name	Set Company Year Month
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter8\Company Year Month.txt
	Condition Type	Request is contained in Value
	Value	CREATE,SAVE *(case sensitive, must match button names)*

8.4 Test Your Work

Save your work and run the module from the Setup ➤ Users menu. You can view the two pages of the module in Figure 8-1.

1. Click the Create button.
2. Enter **SUPER** in UserID, set Group to Admins, select Yes for Administrator, set Default Company to ABC & Company, and click Create. Note that the password column of the new user will be blank at this stage. How to set user passwords is discussed in the next chapter. Modify this user and take a look at the user ID, which should be displayed as an unmodifiable text.
3. Create two more users (belonging to different groups), as shown in Figure 8-1.



	User ID	Group	Company	Year	Month	Password	Admin
	DEMO	Managers	XYZ & Company	2016	July	25F743BE60A13BC099A61DF1B8E734F7	N
	JOHN	Clerks	ABC & Company	2015	July	141D0E145352E25D662334849CEB696A	N
	SUPER	Admins	ABC & Company	2016	July	8B120EAB5607FF97774038A8D34FDADE	Y

User Form

User ID:	SUPER
Group:	Admins
Administrator:	No [✓ Yes]
Default Company:	ABC & Company

Figure 8-1. *Two pages of the module*

8.5 Summary

The users you created in this chapter are the holy souls who can access your application. In the next chapter, you will create a form to set/reset their passwords.

CHAPTER 9

Reset Password

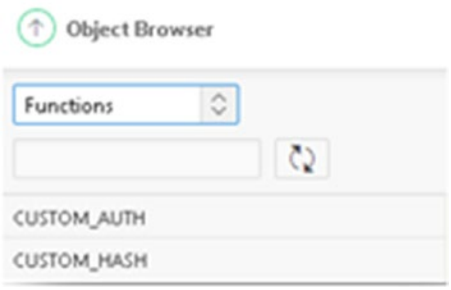
A user who wants to access this application can do so only with a valid ID and password. You created some user accounts in the previous chapter and assigned them IDs and groups. In this chapter, you will create a facility for setting and changing passwords. Note that this feature will be invoked from the Utilities menu. The Reset Password interface is self-explanatory. Administrators select a user ID and then provide and confirm a new password for it. The application then checks to make sure both of these are identical and, if so, allocates the password to the user ID. Users may also use the same method to reset an existing password. The initial password allocation task is performed by the application administrator.

9.1 Add Custom Functions

The users you created in the previous chapter reside in the database table `GL_USERS` without passwords; therefore, none of them can access the application at the moment. You'll create the password interface by adding a blank page to the application, but first you have to add two custom functions, `CUSTOM_AUTH` and `CUSTOM_HASH`, to your database. After receiving login information, the APEX engine evaluates and executes the authentication scheme that will be configured at the end of this chapter. The scheme makes a call to a function named `CUSTOM_AUTH`, which, in conjunction with the `CUSTOM_HASH` function, authenticates users using the credentials stored in the `GL_USERS` table. The two functions are added to the database to implement a custom authentication mechanism. The `CUSTOM_HASH` function is a subordinate function to the `CUSTOM_AUTH` function and is called from the parent function to obfuscate passwords with hash algorithm. Execute the following steps to add these two functions to the database:

1. Open the SQL Commands interface from SQL Workshop.
2. Copy and paste the two functions available in the `Chapter9\Custom Functions.txt` file and click the Run button to store them in the database. If you are using the online APEX version, then create the functions provided in the `CustomFunctions.txt` file, which uses the `DBMS_OBFUSCATION_TOOLKIT` package. For an offline APEX version, use the `Custom_Functions_DBMS_CRYPTO.txt` file.

3. For verification, open the Object Browser interface and locate the two functions in the Functions category, as shown Figure 9-1.



CUSTOM_AUTH
CUSTOM_HASH

Figure 9-1. *Functions category*

Note that the DBMS_OBFUSCATION_TOOLKIT package has been deprecated in favor of DBMS_CRYPTO, which is now used to encrypt and decrypt data. It provides support for various industry-standard encryption and hashing algorithms, including the highly secure Advanced Encryption Standard (AES) encryption algorithm. AES has been approved as a new standard to replace the Data Encryption Standard (DES).

Oracle Database installs the DBMS_CRYPTO package in the SYS schema. In order to use this package, users must be granted access to it, as shown here:

```
conn sys/******** as sysdba
grant execute on sys.dbms_crypto to <user>;
```

Note that you do not have access to the SYS schema in the online APEX version, so you can't use DMBS_CRYPTO.

In a production environment, where you have access to the SYS schema, run the two functions provided in the Custom_Functions_DBMS_CRYPTO.txt file in the user's schema to use DMBS_CRYPTO instead of the DBMS_OBFUSCATION_TOOLKIT package.

9.2 Create Page

Create the password interface using a blank page and then set the attributes listed in Table 9-1. Note that this page will be called from the Reset Password option in the Utilities menu. The query defined in the SQL Query attribute for the Select List (P56_USERID) uses a condition in the WHERE clause (admin='Y') to quickly assess the presence of an administrator, who is allowed to change the password of any user. This is the reason for the inclusion of the Admin column in the GL_USERS table. By setting this condition, the Select List item, which is added to display a list of all users, will be visible to administrators only. Normal users will see only their own user ID in the display item named P56_USERID2.

Table 9-1. *Page Attributes*

Action	Attribute	Value
Create Page	Page Number	56
	Name	Reset Password
	Page Mode	Normal
	Breadcrumb	- don't use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Utilities
Create Region	Title	Reset Password
	Type	Static Content
	Template	Standard
Create Page Item	Name	P56_USERID
	Type	Select List
	Label	<b>User ID:</b>
	Region	Reset Password
	LOV Type	SQL Query
	SQL Query	SELECT userid d, userid r FROM gl_users
	Condition Type	Rows Returned
	SQL Query	SELECT 1 FROM gl_users WHERE userid = :APP_USER AND admin = 'Y'

In Table 9-2, the Display Only item (P56_USERID2) will show the ID of the current nonadmin user using a substitution string. (&APP_USER). The Save Session State attribute is set to YES to store the current item value in the session state when the page gets submitted. If set to No, you'll encounter the error message "No user selected for the reset password process." You also used an opposite `WHERE` clause in the condition query, in contrast to the previous one, to display nonadmin IDs. Finally, you added two password page items. The first one is used to enter the new password, whereas the other one is added for its confirmation.

Table 9-2. *Items and Button Attributes*

Action	Attribute	Value
Create Page Item	Name	P56_USERID2
	Type	Display Only
	Label	<b>User ID:</b>
	Save Session State	Yes
	Region	Reset Password
	Default Type	Static Value
	Static Value	&APP_USER.
	Condition Type	Rows Returned
	SQL Query	SELECT 1 FROM gl_users WHERE userid = :APP_USER AND admin != 'Y'
Create Page Item	Name	P56_PASSWORD1
	Type	Password
	Label	<b>New Password:</b>
	Submit When Enter Pressed	No
	Region	Reset Password
	Template	Required
	Value Required	Yes
Create Page Item	Name	P56_PASSWORD2
	Type	Password
	Label	<b>Confirm Password:</b>
	Submit When Enter Pressed	No
	Region	Reset Password
	Template	Required
	Value Required	Yes
Create Button	Name	RESET_PW
	Label	Reset Password
	Region	Reset Password
	Button Position	Copy
	Hot	Yes
	Action	Submit Page

■ **Note** Upon page submission, the RESET_PW button will run the Update Password process.

9.3 Check User ID and Match Password Validations

In Table 9-3, the first validation checks for the existence of a user ID, while the second one checks for a match.

Table 9-3. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Check User ID
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter9\Check User ID.txt
	Error Message	Select a user for the reset password process
	When Button Pressed	RESET_PW
Create Validation	Name	Match Passwords
	Type	PL/SQL Function Body (returning Boolean)
	PL/SQL Function	Book_Code\Chapter9\Match Passwords.txt
	Error Message	Passwords do not match
	When Button Pressed	RESET_PW

9.4 Update Password Process

The process specified in Table 9-4 will store a new password for the selected user.

Table 9-4. *Update Password Process Attributes*

Action	Attribute	Value
Create Process	Name	Update Password
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter9\Update Password.txt
	Point	Processing
	Success Message	Password changed successfully
	Error Message	Could not change password
	When Button Pressed	RESET_PW

If you run the page at this stage, you won't see the user's select list. This is because the select list item, P56_USERID, is visible only when the currently logged in user is an administrator. Since the account you are currently logged in with doesn't exist in the `GL_USERS` table, the list doesn't appear. To make the list visible, create an admin account for yourself having the same ID you are currently using from the Users option in the Setup menu. After creating your new account, invoke the Reset Password page to test your work by setting passwords for all application users, including yourself. Note that the passwords you set through this interface are case-sensitive; therefore, care must be taken of when saving them. Verify the addition of passwords to the table by accessing the table either from the Object Browser utility in SQL Workshop or through the user report page from the Users menu.

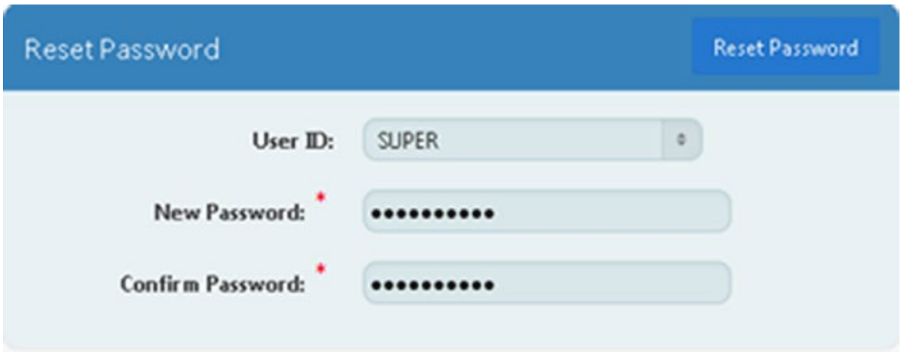
9.5 Change Authentication Scheme

At this stage you can set and browse the users' passwords, but you cannot use these passwords to log in. This is because of the currently implemented authentication scheme, which was set to the Application Express Scheme when you initially created the application. To authenticate the users through their new IDs and passwords, you have to create a custom authentication scheme. Here are the steps to implement this scheme:

1. Select Authentication Scheme from Shared Components.
2. Click the Create button.
3. Select the option Based on the preconfigured scheme from the gallery and click Next.

4. Enter Custom Scheme in the Name box and select Custom as the Scheme Type. On the same page, enter **CUSTOM_AUTH** for the Authentication Function Name attribute. This is the name of the function that you created earlier in this chapter to verify users' credentials on the login page.

5. Click the Create Authentication Scheme button. The new scheme will appear on the page with a check mark. Now you can access the application using the credentials stored in the `GL_USERS` table. Access the Reset Password page, which should look like Figure 9-2.



User ID: SUPER
New Password: * ●●●●●●●●●●●
Confirm Password: * ●●●●●●●●●●●

Figure 9-2. *Reset Password page*

9.6 Summary

Now that you have allowed your users to access the application, you must also allow privileged users to switch company, year, and month, which comes next.

CHAPTER 10

Switch Company, Year, and Month

This page allows users to switch the company, year, and month depending on their access privileges. Recall that every new user was allotted a default company, while an associated process saved a default year and month within their profiles so that they could start using the application right away. These selections are saved in the `GL_USERS` table and are reflected on the top-right corner of every page through the Global Page.

10.1 Create Page

This segment will be created using a blank page. After creating the blank page, add page components, as listed in Table 10-1. The last two select lists added to the page use an attribute called Cascading LOV Parent Item(s). This attribute is used to associate an LOV to its parent. For example, when you select a company, the second list is refreshed to display years of the selected company. Similarly, the third list gets populated with the corresponding months of the selected company.

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Table 10-1. *Page Attributes*

Action	Attribute	Value
Create Page	Page Number	30
	Name	Select
	Page Mode	Normal
	Breadcrumb	- don't use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Select
Create Region	Title	Select
	Type	Static Content
	Template	Standard
Create Page Item	Name	P30_COMPANY
	Type	Select List
	Label	<b>Company</b>
	Region	Select
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	SELECT coname, cocode FROM gl_company ORDER BY cocode
	Source Type	SQL Query (return single value)
	SQL Query	SELECT cocode FROM gl_users WHERE userid = :APP_USER
	Source Used	Always, replacing any existing value in session state

(*continued*)

Table 10-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P30_YEAR
	Type	Select List
	Label	<b>Year</b>
	Region	Select
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	SELECT DISTINCT(coyear) d, coyear r FROM gl_fiscal_year WHERE cocode=:P30_COMPANY ORDER BY coyear
	Cascading LOV Parent Item(s)	P30_COMPANY
	Source Type	SQL Query (return single value)
	SQL Query	SELECT coyear FROM gl_users WHERE userid = :APP_USER
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P30_MONTH
	Type	Select List
	Label	<b>Month</b>
	Region	Select
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	SELECT DISTINCT(comonthname) d, comonthid r FROM gl_fiscal_year WHERE cocode=:P30_COMPANY ORDER BY comonthid
	Cascading LOV Parent Item(s)	P30_COMPANY
	Source Type	SQL Query (return single value)
	SQL Query	SELECT comonthid FROM gl_users WHERE userid = :APP_USER
	Source Used	Always, replacing any existing value in session state

10.2 Add Button

The button in Table 10-2 will submit the page to update the user's profile, using the process mentioned in Table 10-4.

Table 10-2. *Button Attributes*

Action	Attribute	Value
Create Button	Button Name	Select
	Label	Select
	Region	Select
	Button Position	Copy
	Hot	Yes
	Action	Submit Page

10.3 Add Validations

The three validations in Table 10-3 are included to check the switching privileges of a user for the three options.

Table 10-3. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Check Switch Company Privilege
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter10\Switch Company.txt
	Error Message	You are not allowed to switch company
	When Button Pressed	Select *(not -select-)*
Create Validation	Name	Check Switch Year Privilege
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter10\Switch Year.txt
	Error Message	You are not allowed to switch year
	When Button Pressed	Select *(not -select-)*

(*continued*)

Table 10-3. (*continued*)

Action	Attribute	Value
Create Validation	Name	Check Switch Month Privilege
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter10\Switch Month.txt
	Error Message	You are not allowed to switch month
	When Button Pressed	Select *(not -select-)*

10.4 Update User Profile Process

After passing the previous validations, the process specified in Table 10-4 is executed to store new values in the `GL_USERS` table.

Table 10-4. *Update User Profile Process*

Action	Attribute	Value
Create Process	Name	Update User Profile
	Type	PL/SQL Code
	PL/SQL Code	UPDATE gl_users SET cocode=:P30_COMPANY, coyear=:P30_YEAR, comonthid=:P30_MONTH WHERE upper(userid)=upper(:APP_USER);
	Point	Processing
	Success Message	Company/Year/Month switched successfully.
	Error Message	Could not switch company/year/month.
	When Button Pressed	Select

10.5 Display Company, Year, and Month

The page is ready for a test run. Although you can change all the three options as a privileged user, there is no way to know whether the changes have taken place, except for looking at the `GL_USERS` table. In this section, you will make these selections visible on every application page so that users can see the company, year, and month they are working in. You will make use of a Global Page for this purpose. In the main application builder, click the Create Page button. Click the Global Page option to move forward. Accept the default page number (zero) and click the Create button. Add components listed in Table 10-5 to the Global Page.

Table 10-5. *Global Page Attributes*

Action	Attribute	Value
Create Region	Title	User Profile
	Type	Static Content
	Position	Breadcrumb Bar
	Template	Blank with Attributes
	Condition Type	Current Page != Page *(the region will not appear on the login page)*
	Page	101
Create Page Item	Name	P0_USERPROFILE
	Type	Display Only
	Label	*Clear Label*
	Region	User Profile
	Custom Attributes	style="float:right;font-weight:bold;font-size:20;color:#267ed4;"
	Source Type	PL/SQL Function Body
	PL/SQL Function Body	Book_Code\Chapter10\User Profile.txt
	Source Used	Always, replacing any existing value in session state

Everything is set! Run this page (illustrated in Figure 10-1) from the Select menu, change the three options, and see the impact in the user profile region, which should now be visible on every application page.

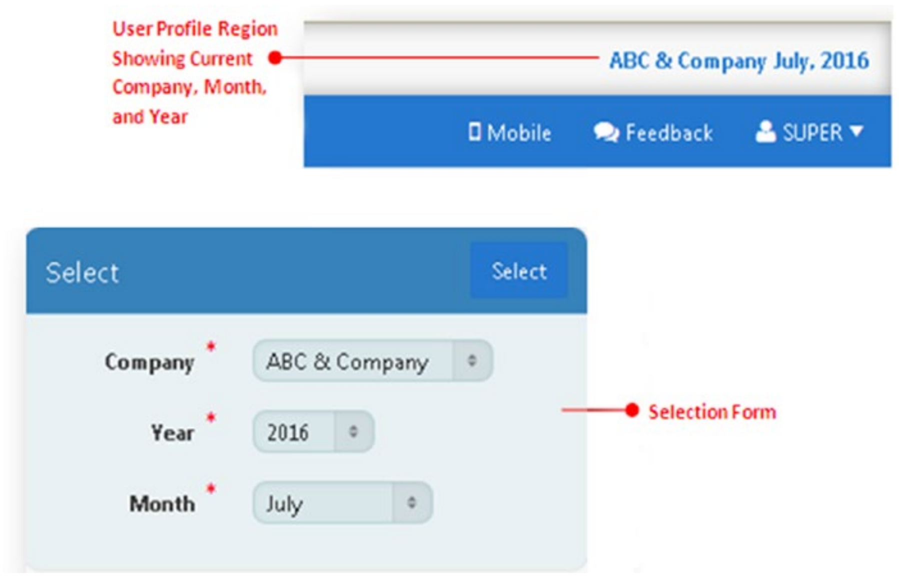

Figure 10-1. *Page to switch company, year, and month*

■ **Note** The Year value shown in the user profile region displays the first part of the fiscal year, which is fetched from the financial year table. For example, the value shown in Figure 10-1 (top) represents 2015–16. A fiscal year starting from July 1, 2015, and ending on June 30, 2016, will be displayed as 2015 for all 12 months, even for January 2016 and onward.

10.6 Summary

Users can access the application and can select their respective companies and fiscal years to post transactions. By creating the cost center setup in the next chapter, you allow these users to lay the foundation of the data entry process.

CHAPTER 11

Cost Centers

Cost and revenue centers help you maintain accounts of all departments and divisions participating in your business. Using this setup, you keep track of revenues generated by departments and expenses incurred by them. After creating cost centers, you can link them to the main financial accounts in the chart of accounts. This allows you to set a default cost/revenue center for every financial account. When you pick up an account from the chart of accounts during the voucher generation process, these cost/revenue centers come along as default entries to minimize data entry work.

COST CENTERS TABLE

```
CREATE TABLE GL_Cost_Center
(Cocode NUMBER CONSTRAINT fk_cost_center REFERENCES GL_Company (Cocode),
Cccode VARCHAR2(5),
Cctitle VARCHAR2(25), Cclevel NUMBER(1),
CONSTRAINT GL_COST_CENTER_PK PRIMARY KEY (Cocode,Cccode) ENABLE)
```

11.1 Create Pages

Create a Form page followed by the Form on a Table with Report option. Using Table 11-1, set the attributes for the two pages.

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Table 11-1. *Two Page Attributes*

Page Type	Attribute	Value
Report Page	Implementation	Interactive
	Page Number	13
	Page Name	Cost Centers Report
	Page Mode	Normal
	Region Title	Cost Centers Setup
	Region Template	Standard
	Breadcrumb	- do not add breadcrumb region to page -
	Table/View owner	*Accept the displayed value*
	Table/View Name	GL_COST_CENTER
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Setup
	Report Columns	Select 3 columns – CCCODE,CCTITLE, and CCLEVEL
	Edit Link Image	*Select any edit link image from the provided options*
Form Page	Page Number	14
	Page Name	Cost Centers Form
	Page Mode	Modal Dialog
	Region Title	Cost Center
	Region Template	Standard
	Primary Key Type	Managed by Database (ROWID)
	Form Columns	Select 3 columns – CCCODE,CCTITLE, and CCLEVEL
	Data Manipulation Process	Insert=Yes, Update=Yes, Delete=Yes

After creation, modify the report page (13) to alter the default SQL statement. A `WHERE` clause is added to the default SQL query (indicated in Table 11-2), which fetches the current company's cost centers.

Table 11-2. *Modified Query*

Action	Attribute	Value
Modify Region	Region	Cost Centers Setup
	SQL Query	SELECT "ROWID", "CCCODE","CCTITLE","CCLEVEL" FROM "#OWNER#"."GL_COST_CENTER" **WHERE cocode = (select cocode from gl_users where userid = :app_user)**

11.2 Delete Processes

Remove the two default processes (Process Row of GL_COST_CENTER and reset page) created by the wizard from page 14, along with the CREATE and APPLY CHANGES buttons. You'll create custom processes and add a new button to handle these operations.

11.3 Modify Delete Button

On page 14, modify the Delete button (which was created by the wizard) using the attributes mentioned in Table 11-3. You use a JavaScript function to present a confirmation box, before deleting a record. Note that the visibility of this button and the corresponding delete process is controlled by a condition set on this page, which states that this button will be visible only when the P14_ROWID page item is `NOT NULL`, in other words, when the record is fetched from page 13 for modification. You also disable the default database action (SQL `DELETE` action) because you handle this process manually; see Table 11-13.

Table 11-3. *Modified Delete Button*

Action	Attribute	Value
Modify Button	Button Name	DELETE
	Action	Redirect to URL
	Target	javascript:apex.confirm('Are you sure you wish delete this record?','DELETE');
	Execute Validations	Yes
	Database Action	- Select -

11.4 Add Button

Add a new button to page 14 using Table 11-4 to handle new and amended records.

Table 11-4. *New Button Attributes*

Action	Attribute	Value	Attribute	Value
Create Button	Name	Save	Button Position	Create
	Label	Save	Hot	Yes
	Region	Buttons	Action	Submit Page

11.5 Modify Page Items

Modify page 14 items using Table 11-5. Note that the Level column will be displayed as a read-only item.

Table 11-5. *Modified Page Item Attributes*

Action	Attribute	Value
Modify Item	Name	P14_CCCODE
	Template	Required
	Value Required	Yes
	Width/Maximum Length	5
Modify Item	Name	P14_CCTITLE
	Template	Required
	Value Required	Yes
Modify Item	Name	P14_CCLEVEL
	Type	Display Only
	Save Session State	No

11.6 Add Dynamic Action: Evaluate Level

The dynamic action specified in Table 11-6 will be created on page 14 to calculate a level for each cost center account. Note that this setup comprises two levels. The first level, which denotes locations, is two digits long (99), while the second one, which represents departments or divisions, carries five digits (99999). The first two digits in the second level represent its parent level.

Table 11-6. *Dynamic Action Attributes*

Action	Attribute	Value	Attribute	Value
Create Dynamic Action	Name	Evaluate Level	PL/SQL Code	Book_Code\Chapter11\Evaluate Level.txt
	Event	Lose Focus		
	Selection Type	Item(s)	Page Items to Submit	P14_CCCODE
	Item(s)	P14_CCTITLE	Page Items to Return	P14_CCLEVEL
	Action (under Show)	Execute PL/SQL Code	Fire on Page Load	Yes

11.7 Validation: Check Level

The validation specified in Table 11-7 will check whether the value of the account level is zero. Note that the valid values for this item are 1 and 2 only. The dynamic action created in the previous section will calculate this value automatically.

Table 11-7. *Validation: Check Level*

Action	Attribute	Value
Create Validation	Name	Check Level
	Validation Type	Item is NOT zero
	Item	P14_CCLEVEL
	Error Message	You've defined an invalid Cost Center code.
	When Button Pressed	Save

11.8 Validation: Check Parent Level

As the name suggests, the validation specified in Table 11-8 is added to check the parent level of an account. To implement application integrity, you are not allowed to create an account without a parent. For example, in the current setup, a department cannot be created without first creating a location.

Table 11-8. *Validation: Check Parent Level*

Action	Attribute	Value
Create Validation	Name	Check Parent Level
	Type	PL/SQL Function Body (returning Boolean)
	PL/SQL Function	Book_Code\Chapter11\Check Parent Level.txt
	Error Message	Parent level not found.
	When Button Pressed	Save

■ **Note** Duplicate cost center code is eliminated by the table constraint (`GL_COST_CENTER_PK PRIMARY KEY (Cocode,Cccode)`), which shows the generic message "An error occurred while saving Cost Center record when you try to enter a code which already exists." To inform the user about the actual problem, you can create a validation to search the table for an existing cost center code prior to saving a record.

11.9 Validation: Check Child Level

Just like the way you checked for the existence of the parent level while *creating a new* child account, the validation in Table 11-9 will check for the existence of a child account before *deleting* a parent level account.

Table 11-9. *Validation: Check Child Level*

Action	Attribute	Value
Create Validation	Name	Check Child Level
	Type	PL/SQL Function Body (returning Boolean)
	PL/SQL Function	Book_Code\Chapter11\Check Child Level.txt
	Error Message	Child account found. Unable to delete cost center record.
	When Button Pressed	DELETE

11.10 Validation: Check in Transaction

An account used even in a single transaction must not be deleted. The validation in Table 11-10 is added for this purpose. Note that in this application you will use the last level (in other words, level 2) in your transactions to allocate cost centers.

Table 11-10. *Validation: Check in Transaction*

Action	Attribute	Value
Create Validation	Name	Check in Transaction
	Type	PL/SQL Function Body (returning Boolean)
	PL/SQL Function	Book_Code\Chapter11\Check in Transaction.txt
	Error Message	Account used in transaction. Unable to delete cost center record.
	When Button Pressed	DELETE

11.11 Validation: Disallow Code Modification

Cost centers are rendered in a text item that an end user can easily modify. The validation specified in Table 11-11 will prevent the code from being modified in order to retain application consistency. The condition set for this validation checks for a value in the hidden item (P14_ROWID). A non-null value in this item indicates that a record exists on the page with its code.

Table 11-11. *Validation: Disallow Code Modification*

Action	Attribute	Value
Create Validation	Name	Disallow Code Modification
	Type	PL/SQL Function Body (returning Boolean)
	PL/SQL Function	Book_Code\Chapter11\Disallow Code Modification.txt
	Error Message	Cost Center code cannot be modified.
	When Button Pressed	Save
	Condition Type	Item is NOT NULL
	Item	P14_ROWID

11.12 Process: Save Record

The process being created in Table 11-12 is the one that will save a cost center record. Note that this process will handle both new and updated cost centers.

Table 11-12. *Process: Save Record Attributes*

Action	Attribute	Value
Create Process	Name	Save Record
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter11\Save Record.txt
	Sequence	10
	Point	Processing
	Success Message	Cost Center record saved.
	Error Message	An error occurred while saving Cost Center record.
	When Button Pressed	Save

11.13 Process: Delete Record

This process mentioned in Table 11-13 will delete a cost center record after passing all validations.

Table 11-13. *Delete Record Process Attributes*

Action	Attribute	Value
Create Process	Name	Delete Record
	Type	PL/SQL Code
	PL/SQL Code	DELETE FROM gl_cost_center WHERE CCcode=:P14_CCcode AND cocode= (SELECT cocode FROM gl_users WHERE userid = :app_user);
	Sequence	20 *(to execute before the Close Dialog process)*
	Point	Processing
	Success Message	Cost Center record deleted.
	Error Message	An error occurred while deleting Cost Center record.
	When Button Pressed	DELETE

Remove the CREATE and SAVE button values from the request specified in the Close Dialog process to generate continuous cost center records. In the Processing tab, click the Close Dialog process. Scroll down to the Condition section in the properties editor, and remove the CREATE and SAVE entries from the Value list. By default, the modal page is closed when the Create, Save, or Delete buttons are clicked. By removing the CREATE and SAVE entries, the dialog page will be closed only when the Delete button is clicked.

11.14 Add Button: Refresh

Create a button on page 13 using the attributes listed in Table 11-14 to refresh the cost centers report.

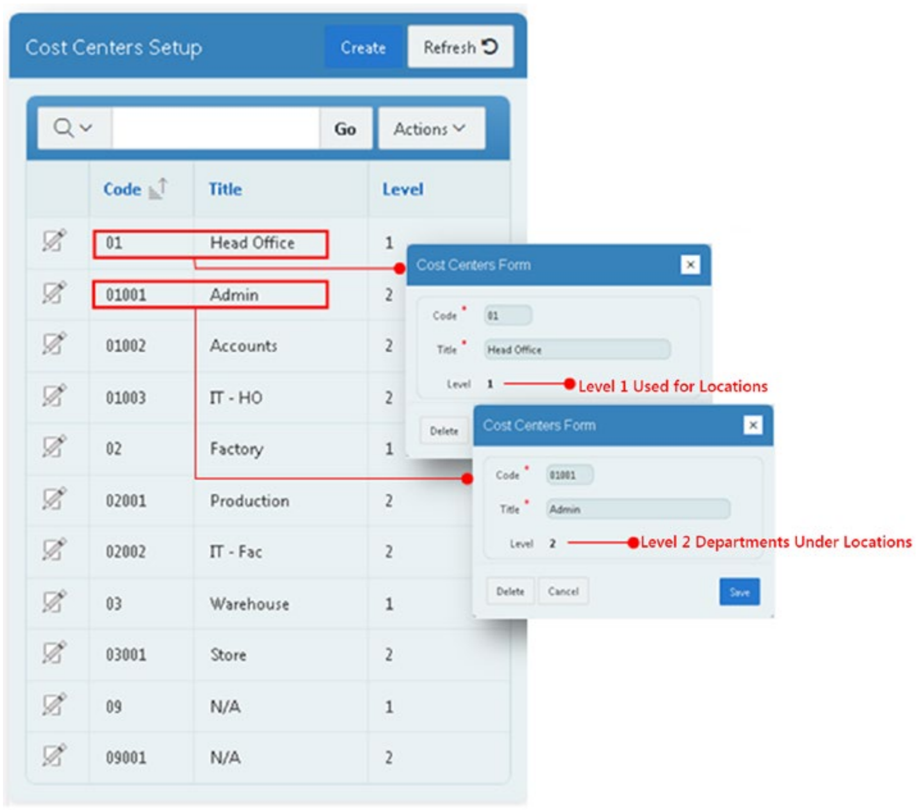
Table 11-14. *Refresh Button Attributes*

Attribute	Value
Button Name	Refresh
Label	Refresh
Region	Cost Centers Setup
Button Position	Copy
Button Template	Text with Icon
Hot	No
Icon CSS Classes	fa-undo
Action	Submit Page

11.15 Test Your Work

After saving your work, execute the following steps to create cost centers in the application:

1. Run the module from the Setup | Cost Centers menu. Figure 11-1 illustrates the two pages of this module.
2. Click Create on page 13.
3. Enter **01** in Code and **Head Office** in Title.
4. Click the Save button. This will add a new cost center level-one record.
5. Create a new record by entering **01001** for Code and **Admin** for Title. Click Save. This will create the Admin department under the Head Office location. Note that the levels for both these accounts are assessed automatically by the dynamic action created through Table 11-6.
6. Using the file `Cost Centers.xls`, in the `Book_Code\Chapter11` folder, create the remaining cost centers. The last entry ("09-N/A - not applicable"*)* in the XLS file will be used for all financial accounts in the Chart of Accounts (coming up next) where cost centers are inapplicable.



Code	Title	Level
01	Head Office	1
01001	Admin	2
01002	Accounts	2
01003	IT - HO	2
02	Factory	1
02001	Production	2
02002	IT - Fac	2
03	Warehouse	1
03001	Store	2
09	N/A	1
09001	N/A	2

Code	01
Title	Head Office
Level	1

Code	01001
Title	Admin
Level	2

Figure 11-1. *Cost centers pages*

11.16 Summary

The cost center is a handy setup for organizations that want to keep track of income and expenses. In the next chapter, you will create the heart of financial accounting called the *chart of accounts*.

CHAPTER 12

Chart of Accounts

The chart of accounts (COA) is part of the application that needs to be planned carefully before implementation. A well-planned COA provides better insight into the financial matters of an organization. A separate COA is created for each company; however, you can create a COA for one company—the master COA—and then copy it to the others using the Copy COA utility as developed in the next chapter. The accounts created here are selected for each transaction during voucher generation, report calls, and preparation of financial statements. Because this setup is similar to the cost center setup, you will use the copy utility to save some time. The account code used in this setup uses the format 9-99-999-99999, which contains four separate number groupings or levels. The first level defines the nature of account, while the next three levels act as its subcategories. Each account specified on the first level belongs to one of the following natures: Equities, Liabilities, Assets, Revenues, and Expenses. The initial three levels are called *group levels*, whereas the bottom level (in other words, level 4) is called the *transaction level* because accounts from this level are selected to generate transactions in the vouchers interface. The group-level accounts are used in trial balance and financial statement reports to extract summarized group-level information.

CHART OF ACCOUNTS TABLE

```
CREATE TABLE GL_COA
(Cocode NUMBER CONSTRAINT fk_coa REFERENCES GL_Company (Cocode), COAcode
VARCHAR2(11),
COAtitle VARCHAR2(50), COAlevel NUMBER(1), COAnature VARCHAR2(11), COAtype
VARCHAR2(11), Cccode VARCHAR2(5), CONSTRAINT GL_COA_PK PRIMARY KEY
(Cocode,COAcode) ENABLE)
```

R. Ahmed, *Cloud Computing Using Oracle Application Express*,
DOI 10.1007/978-1-4842-2502-8_12

12.1 Create Three Lists of Values

Create three LOVs from scratch using Tables 12-1 to 12-3. The first one will show departments (level 2) from the cost centers table for association with financial accounts. This association is not mandatory. The second LOV contains the five natures mentioned earlier for assignment to the first level. The third LOV is created to identify bank accounts. It will be visible for the last level only. All accounts marked as "Bank" type in the chart of accounts will be used in Chapter 21. Accounts other than banks will be marked as "Others" for distinction. Take a look at the `COA.xls` file provided in the downloaded code's Chapter 12 folder.

1. Tables 12-1 shows attributes for the Cost Center LOV.

Table 12-1. *First LOV*

Attribute	Value
Name	Cost Centers
Type	Dynamic
Query	SELECT cccode||'-'||cctitle t, cccode c FROM gl_cost_center WHERE cclevel=2 AND cocode=(select cocode from gl_users where userid=:APP_USER) ORDER BY 1

2. Set the Name of the second LOV to COA Nature, and its Type to Static.

Table 12-2. *Second LOV*

Display Value	Return Value
Equities	Equities
Liabilities	Liabilities
Assets	Assets
Revenues	Revenues
Expenses	Expenses

3. Set the Name of the third LOV to COA Types, and its Type to Static.

Table 12-3. *Third LOV*

Display Value	Return Value
Bank	Bank
Others	Others

12.2 Copy Pages

The COA interface will be created by copying the two pages from the Cost Centers segment. Open the Cost Centers Report page (Page 13). Next click the Create menu and select the option Page as Copy. In the copy page wizard, set the attributes mentioned in Table 12-4.

Table 12-4. *Copy Pages Attributes*

Attribute	Value
Create a page as a copy of	Page in this application
Copy from Page	13. Cost Centers Report
Copy to New Page Number	15
New Page Name	Chart of Accounts Report
Breadcrumb	- do not use breadcrumbs on page -
Button (New Value)	Create and Refresh *(accept the default new values)*
Region (New Value)	Chart of Accounts Setup
Navigation Preference	Identify an existing navigation menu entry for this page
Existing Navigation Menu Entry	Setup

Now open the Cost Centers Form page (page 14) and repeat the previous steps to make a copy of it using the attributes listed in Table 12-5.

Table 12-5. *Page Copy Attributes*

Attribute	Value
Page as a copy of	Page in this application
Copy from Page	14. Cost Centers Form
New Page Number	16
New Page Name	Chart of Accounts Form
Breadcrumb	- do not use breadcrumbs on page -
Cost Center Region New Value	Chart of Accounts
Navigation Preference	Identify an existing navigation menu entry for this page
Existing Navigation Menu Entry	Setup

12.3 Modify the Report Page (Page 15)

Modify the COA report page by setting the attributes listed in Table 12-6.

Table 12-6. *COA Report Page Modified*

Action	Attribute	Value
Modify Region	Region Title	Chart of Accounts Setup

	SQL Query	SELECT "ROWID", "COACODE", "COATITLE", "COALEVEL", "COANATURE", "COATYPE", "CCCODE"
		FROM "#OWNER#"."GL_COA"
		WHERE cocode = (select cocode from gl_users where userid = :app_user)
		ORDER BY coacode

Modify Interactive Report	Column Headings	*Set appropriate column headings as shown in Figure 12-2*
	Target *(under Attributes)*	16 *(replacing the existing value 14 to point to the COA form page)*
	Name *(under Set Items)*	P16_ROWID *(previous value is P14_ROWID)*
Modify Button	Button Name	CREATE
	Target	Page = 16 *(to call COA Form page)* Clear Cache = 16

12.4 Modify the Form Page (Page 16)

When you call this page to modify a COA entry, you'll see three items: P16_CCCODE, P16_CCTITLE, and P16_CCLEVEL. These items relate to the cost centers setup. In this section, you'll modify these items and will add a few more for this setup, as mentioned in Tables 12-7 to 12-9.

Table 12-7. *P16_CCCODE, P16_CCTITLE, and P16_CCLEVEL Attributes*

Attribute	P16_CCCODE	P16_CCTITLE	P16_CCLEVEL
Name (new)	P16_COACODE	P16_COATITLE	P16_COALEVEL
Width	11	50	
Maximum Length	11	50	
Type *(under Source)*	Database Column	Database Column	Database Column
Database Column	COACODE	COATITLE	COALEVEL

Add the new items in Table 12-8 to this page.

Table 12-8. *New Item Attributes*

Action	Attribute	Value
Create Page Item	Name	P16_COANATURE
	Type	Select List
	Label	Nature
	Region	Chart of Accounts Form
	Value Required	No *(because nature is not required for levels greater than 1)*
	LOV Type	Shared Component
	Shared Component	COA NATURE *(Table 12-2)*
	Display Null Value	No
	Source Type	Database Column
	Database Column	COANATURE
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P16_NATURE_DISPLAY
	Type	Display Only
	Label	Nature
	Save Session State	No
	Region	Chart of Accounts Form
	Source Type	Null

(*continued*)

Table 12-8. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P16_COATYPE
	Type	Select List
	Label	Account Type
	Region	Chart of Accounts Form
	Value Required	No *(because it is not required for levels 1 through 3)*
	LOV Type	Shared Component
	Shared Component	COA TYPES *(Table 12-3)*
	Display Extra Values	No
	Display Null Value	Yes
	Source Type	Database Column
	Database Column	COATYPE
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P16_CCCODE
	Type	Popup LOV
	Label	Cost Center
	Value Required	No
	LOV Type	Shared Component
	Shared Component	COST CENTERS *(Table 12-1)*
	Source Type	Database Column
	Database Column	CCCODE
	Source Used	Always, replacing any existing value in session state

On the Rendering tab, expand the node labeled Pre-Rendering. Modify the process named Fetch Row from GL_COST_CENTER under this node to show and link to the correct segment, as shown in Table 12-9.

Table 12-9. *Fetch Row Process Modifications*

Action	Attribute	Value
Modify Process	Name (new)	Fetch Row from GL_COA
	Table Name	GL_COA
	Primary Key Column	ROWID
	Primary Key Item	P16_ROWID

12.5 Modify/Create Dynamic Actions

Modify the Evaluate Level dynamic action. In the When section, change item(s) from P16_CCTITLE to P16_COACODE. Expand this dynamic action node and click Execute PL/SQL Code under the True subnode to set the attributes listed in Table 12-10. The value of level is determined by the code size.

Table 12-10. *Evaluate Level Modifications*

Action	Attribute	Value
Modify Dynamic Action	PL/SQL Code	Book_Code\Chapter12\Evaluate Level.txt
	Page Items to Submit	P16_COACODE
	Page Items to Return	P16_COALEVEL

Create the dynamic actions listed in Table 12-11 to 12-20 to show/hide P16_COANATURE and other page items when the value of the Level page item changes.

Table 12-11. *Hide Show Item Dynamic Action*

Action	Attribute	Value
Create Dynamic Action	Name	Hide Show Item
	Event	Change
	Selection Type	Item(s)
	Item	P16_COALEVEL
	Condition	equal to
	Value	1

■ **Note** The previous condition is set for the dynamic action. It says the following:

```
If P16_COALEVEL=1 then
   Show: P16_COANATURE and
   Hide: P16_NATURE_DISPLAY,P16_COATYPE,P16_CCCODE
Else
   Hide: P16_COANATURE
```

Table 12-12 shows the true action attributes.

Table 12-12. *True Action Attributes*

Attribute	Value
Action	Show
Selection Type	Item(s)
Item(s)	P16_COANATURE *(this is the page element to control)*
Fire On Page Load	Yes

Now, right-click the False node, and select Create False Action. Set the attributes in Table 12-13 for the False action.

Table 12-13. *False Action Attributes*

Attribute	Value
Action	Hide
Selection Type	Item(s)
Item(s)	P16_COANATURE
Fire On Page Load	Yes

Add another True action under the True node using the attributes in Table 12-14.

Table 12-14. *Second True Action Attributes*

Attribute	Value
Action	Hide
Selection Type	Item(s)
Item(s)	P16_NATURE_DISPLAY,P16_COATYPE,P16_CCCODE
Fire On Page Load	Yes

Create the dynamic action in Table 12-15 to show/hide the Type and Cost Center items when the value of Level is 4.

Table 12-15. *Show Type and Cost Center Dynamic Action*

Action	Attribute	Value
Create Dynamic Action	Name	Show Type and Cost Center
	Event	Change
	Selection Type	Item(s)
	Item	P16_COALEVEL
	Condition	equal to
	Value	4

■ **Note** The condition says the following:

```
If P16_COALEVEL=4 then
   Show: P16_COATYPE,P16_CCCODE
Else
   Hide: P16_COATYPE,P16_CCCODE
```

Table 12-16 shows the true action attributes.

Table 12-16. *True Action Attributes*

Attribute	Value
Action	Show
Selection Type	Item(s)
Item(s)	P16_COATYPE, P16_CCCODE
Fire On Page Load	Yes

Right-click the False node, and select Create False Action. Set the attributes in Table 12-17 for the False action.

Table 12-17. *False Action Attributes*

Attribute	Value
Action	Hide
Selection Type	Item(s)
Item(s)	P16_COATYPE, P16_CCCODE
Fire On Page Load	Yes

Evaluate and turn the account nature into a display-only item based on the first level, for level numbers 2, 3, and 4, as shown in Table 12-18.

Table 12-18. *Evaluate Nature Item Dynamic Action*

Action	Attribute	Value
Create Dynamic Action	Name	Evaluate Nature
	Event	Lose Focus
	Selection Type	Item(s)
	Item(s)	P16_COACODE
	Action *(under Show node)*	Execute PL/SQL Code
	PL/SQL Code	Book_Code\Chapter12\ Evaluate Nature.txt
	Page Items to Submit	P16_COACODE
	Page Items to Return	P16_NATURE_DISPLAY
	Fire on Page Load	Yes

Create the dynamic action in Table 12-19 to show/hide P16_NATURE_DISPLAY when the value of Level is > 1.

Table 12-19. *Display Nature Dynamic Action*

Action	Attribute	Value
Create Dynamic Action	Name	Display Nature
	Event	Change
	Selection Type	Item(s)
	Item	P16_COALEVEL
	Condition	greater than
	Value	1

Table 12-20 lists the true action attributes.

Table 12-20. *True Action Attributes*

Attribute	Value
Action	Show
Selection Type	Item(s)
Item(s)	P16_NATURE_DISPLAY
Fire On Page Load	Yes

Create a False action by selecting Create False Action. Set the attributes shown in Table 12-21 for the False action.

Table 12-21. *False Action Attributes*

Attribute	Value
Action	Hide
Selection Type	Item(s)
Item(s)	P16_NATURE_DISPLAY
Fire On Page Load	Yes

12.6 Modify Validations

Using Table 12-22 modify the five page validations.

Table 12-22. *Modify Validations*

Check Level	
Attribute	**Value**
Type	Item is NOT zero
Item	P16_COALEVEL
Error Message	You've defined an invalid account code
Check Parent Level	
Attribute	**Value**
PL/SQL Function Body Returning Boolean	Book_Code\Chapter12\Check Parent Level.txt
Error Message	Parent level not found

(*continued*)

Table 12-22. (*continued*)

Check Child Level	
Attribute	**Value**
PL/SQL Function Body Returning Boolean	Book_Code\Chapter12\Check Child Level.txt
Error Message	Child level found. Unable to delete account.
Check in Transaction	
Attribute	**Value**
PL/SQL Function Body Returning Boolean	Book_Code\Chapter12\Check in Transaction.txt
Error Message	Can't delete. Account has been used in transaction.
Disallow Code Modification	
Attribute	Value
PL/SQL Function Body Returning Boolean	Book_Code\Chapter12\Disallow Code Modification.txt
Error Message	Account code cannot be modified

12.7 Create Validation: Check Account Type

Each transaction level account (for example, level 4) must be associated with one of the two specified types—Bank or Others. The validation created in Table 12-23 will prompt users to select one from the specified two types.

Table 12-23. *Validation: Check Account Type*

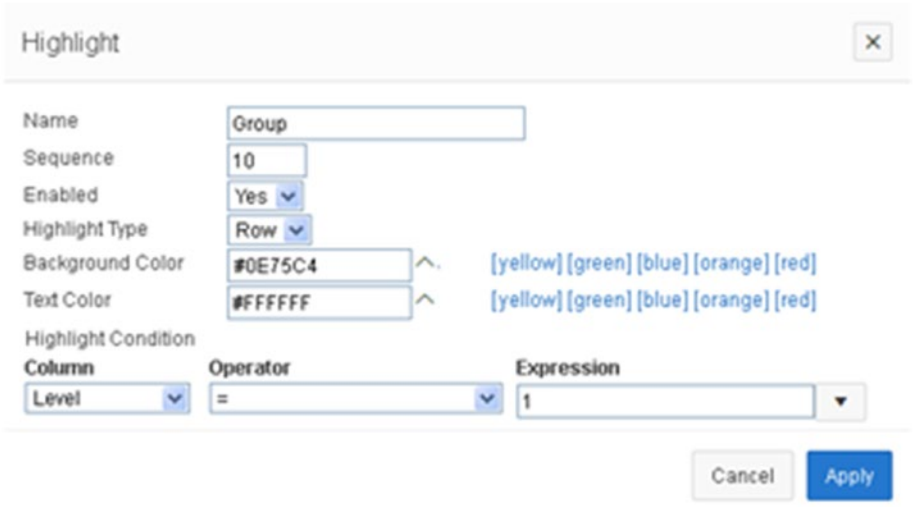
Action	Attribute	Value
Create Validation	Name	Check Account Type
	Type	Item is NOT NULL
	Item	P16_COATYPE
	Error Message	Please select a Type for the new account
	When Button Pressed	Save
	Condition Type	Item = Value
	Item	P16_COALEVEL
	Value	4

12.8 Modify Processes

Modify the two processes (Save Record and Delete Record) using the PL/SQL code provided in the `Save Record.txt` and `Delete Record.txt` files (in the Chapter12 folder), respectively. Also, replace the existing success and error messages with the appropriate text to reflect the current module.

12.9 Create a Highlight Rule

Save your progress and run the module from the Setup ➤ Chart of Accounts menu. Using the Actions menu, create a highlight rule (Actions ➤ Format ➤ Highlight) to highlight the root level, as shown in Figure 12-1. Also, arrange the report columns using the Actions menu in the sequence illustrated in Figure 12-2 (later in the chapter).


Highlight

Name	Group
Sequence	10
Enabled	Yes
Highlight Type	Row
Background Color	#0E75C4
Text Color	#FFFFFF

Highlight Condition

Column	Operator	Expression
Level	=	1

[yellow] [green] [blue] [orange] [red]
[yellow] [green] [blue] [orange] [red]
Cancel
Apply

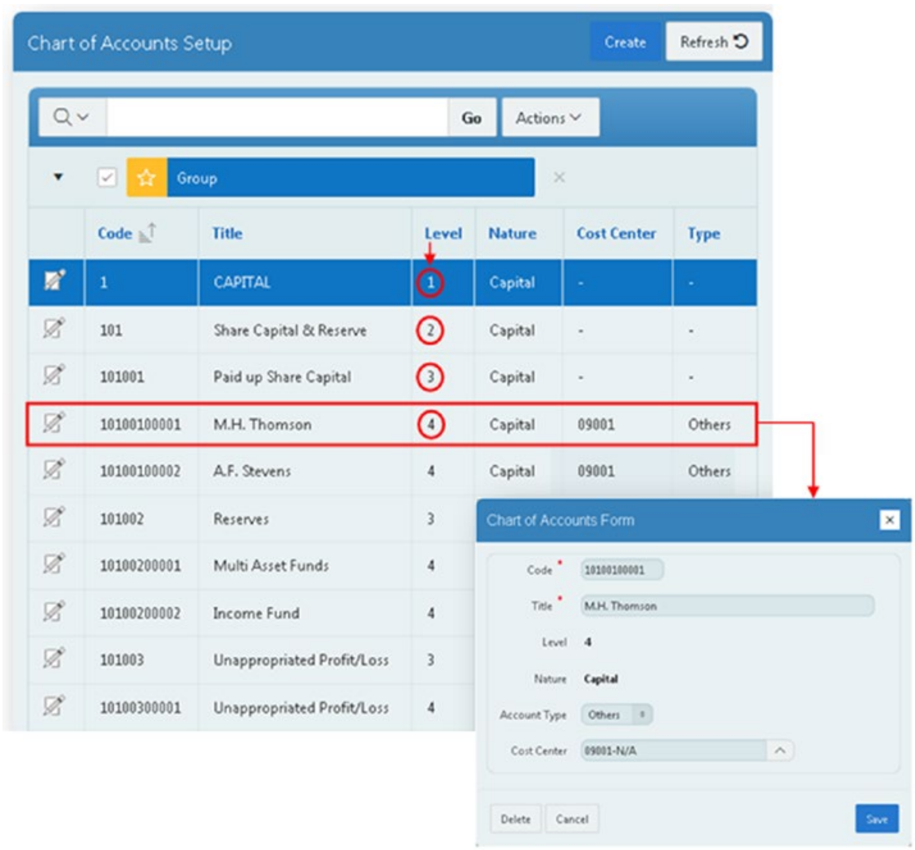
Figure 12-1. *Highlight rule*

12.10 Test Your Work

Click the Create button (on page 15) to add the accounts listed in Table 12-24. Figure 12-2 illustrates the two pages of this module. Note that the Level value will be generated automatically for each account. Similarly, the account nature will be inherited by subaccounts from the first level. Use the `COA.xls` file—located in the Chapter12 folder—to create the complete chart of accounts.

Table 12-24. *Accounts to Add*

Code	Title	Level	Nature	Type	Cost Center
1	Capital	1	Capital	N/A	N/A
101	Share Capital & Reserve	2	Capital (Inherited from parent)	N/A	N/A
101001	Paid up Share Capital	3	Capital (Inherited from parent)	N/A	N/A
10100100001	M.H. Thomson	4	Capital (Inherited from parent)	Others	09001



Code	Title	Level	Nature	Cost Center	Type
1	CAPITAL	1	Capital	-	-
101	Share Capital & Reserve	2	Capital	-	-
101001	Paid up Share Capital	3	Capital	-	-
10100100001	M.H. Thomson	4	Capital	09001	Others
10100100002	A.F. Stevens	4	Capital	09001	Others
101002	Reserves	3			
10100200001	Multi Asset Funds	4			
10100200002	Income Fund	4			
101003	Unappropriated Profit/Loss	3			
10100300001	Unappropriated Profit/Loss	4			

Code *	10100100001
Title *	M.H. Thomson
Level	4
Nature	Capital
Account Type	Others
Cost Center	09001-N/A

Figure 12-2. *Chart of accounts pages*

12.11 Summary

The chart of accounts setup is the most important segment; without it, you cannot post transactions in the application. It requires ample time to plan, design, and create the chart of accounts. Once you create it in this application, you can copy this master COA to other companies to save time. The next chapter will show you how to do that.

CHAPTER 13

Copy Chart of Accounts

As mentioned earlier, the application has the capability of maintaining the accounts of multiple companies simultaneously. To complement this feature, the application contains a utility to allow you to copy the chart of accounts from one company to another. Obviously, this is a great time-saver when setting up a new company. Before you start development, make sure that the source COA has been created successfully before invoking this utility. The page for this module consists of two select lists. The first one allows you to specify the source company whose COA you want to copy from, while the second one allows you to select the target company you want to copy the source COA to.

13.1 Create Page

This segment will be created manually using a blank page. After creating the blank page, you'll add some items and a button to it along with a corresponding process to save a COA for the target company. Create the page and page items as listed in Table 13-1.

Table 13-1. *Page Attributes*

Action	Attribute	Value
Create Page	Page Number	54
	Name	Copy COA
	Page Mode	Normal
	Breadcrumb	- don't use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Utilities
Create Region	Title	Copy Chart of Accounts
	Type	Static Content
	Template	Standard

(*continued*)

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Table 13-1. *(continued)*

Action	Attribute	Value
Create Page Item	Name	P54_SOURCE
	Type	Popup LOV
	Label	<b>Source Company:</b>
	Region	Copy Chart of Accounts
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	Shared Component	COMPANIES
Create Page Item	Name	P54_TARGET
	Type	Popup LOV
	Label	<b>Target Company:</b>
	Region	Copy Chart of Accounts
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	Shared Component	COMPANIES

13.2 Add Button

Add a button to the page using Table 13-2. This button will submit the page to run the Copy COA process, covered later in the chapter.

Table 13-2. *Button Attributes*

Action	Attribute	Value
Create Button	Button Name	Copy
	Label	Copy
	Region	Copy Chart of Accounts
	Button Position	Copy
	Hot	Yes
	Action	Submit Page

13.3 Add Validations

The three validations listed in Table 13-3 will ensure that the copy operation is possible.

Table 13-3. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Select Different Companies
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter13\Select Different Companies.txt
	Error Message	Select different Source and Target companies
	When Button Pressed	Copy
Create Validation	Name	Check Source COA
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter13\Check Source COA.txt
	Error Message	Chart of Accounts for the source company doesn't exist
	When Button Pressed	Copy
Create Validation	Name	Check Target COA
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter13\Check Target COA.txt
	Error Message	Chart of Accounts for the target company already exists
	When Button Pressed	Copy

13.4 Copy COA Process

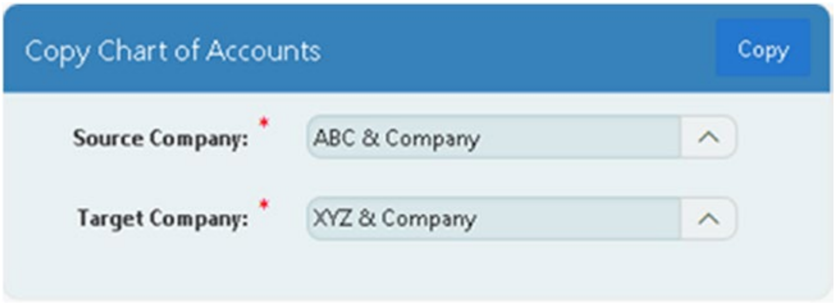
The process listed in Table 13-4 will copy the source COA to the selected target company, assuming, of course, the previous three validations were successful.

Table 13-4. *Copy COA Process Attributes*

Action	Attribute	Value
Create Process	Name	Copy COA
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter13\Copy COA.txt
	Point	Processing
	Success Message	Chart of Accounts copied successfully
	Error Message	Could not copy chart of accounts
	When Button Pressed	Copy

13.5 Test Your Work

Testing of this segment is simple. Invoke this module from the Copy Chart of Accounts option under the Utilities menu. You will see a small form illustrated in Figure 13-1. Select a company from the source LOV whose COA already exists in the database and then attempt to copy it to a company that does not have a COA. The selected company's COA should be copied to the target company followed by the success message. Click the button again and see what happens. It should, of course, fail this time.



Copy Chart of Accounts

Source Company: * ABC & Company

Target Company: * XYZ & Company

Figure 13-1. *Simple form*

13.6 Summary

After creating the COA for both companies, now you are in a position to post financial transaction through vouchers, which is coming next.

CHAPTER 14

Enter Vouchers

This is the segment that you use to enter and record financial transactions. On the initial page of this segment, you select a voucher type, which you created in Chapter 5. The underneath report gets populated with all the vouchers related to the selected type. Clicking the Create button calls the voucher form page, where you create a new voucher for the selected type. The voucher form page contains two regions. The Enter Voucher region displays the selected voucher type and three text items to input the voucher number, date, and description. The number item can receive values up to ten digits, whereas the date should fall in the month being displayed at the top of the page. Add a description of up to 150 characters to describe the transaction. In the Transaction Details region, you enter transactions by selecting the affected accounts from the COA and cost centers, and you input the amount involved in the transaction either in the Debit or Credit column. The Reference column is used to save additional information, such as check or invoice numbers. Using the Add Row button, you can record any number of transactions in a single voucher.

VOUCHER TABLES

--S6A-- TRANSACTION MASTER TABLE

```
CREATE TABLE gl_tran_master
(Tran_No NUMBER, Cocode NUMBER CONSTRAINT fk_tran_master1 REFERENCES
gl_company (Cocode) NOT NULL,
Coyear NUMBER(4) NOT NULL, comonthid NUMBER(2) NOT NULL,
vchcode NUMBER CONSTRAINT fk_tran_master2 REFERENCES gl_voucher(vchcode)
NOT NULL,
vchno NUMBER(10) NOT NULL, vchdate DATE NOT NULL,
vchdescription VARCHAR2(150) NOT NULL, createdby VARCHAR2(10) NOT NULL,
createdon DATE NOT NULL,
vchverified VARCHAR2(1) NOT NULL, vchposted VARCHAR2(1) NOT NULL, closing
NUMBER(1) NOT NULL,
CONSTRAINT pk_tran_master PRIMARY KEY (tran_no),
CONSTRAINT fk_tran_master3 FOREIGN KEY (Cocode,Coyear,Comonthid) REFERENCES
gL_fiscal_year)
```

DOI 10.1007/978-1-4842-2502-8_14

--S6B-- TRANSACTION DETAILS TABLE

```
CREATE TABLE gl_tran_detail
(Line_No NUMBER, Tran_No NUMBER NOT NULL,
Cocode NUMBER CONSTRAINT fk_tran_detail1 REFERENCES GL_Company (Cocode)
NOT NULL,
coacode VARCHAR2(11) NOT NULL, cccode VARCHAR2(5), vchdescription
VARCHAR2(150) NOT NULL,
vchdr NUMBER(15,2) NOT NULL, vchcr NUMBER(15,2) NOT NULL, vchreference
VARCHAR2(25),
reconciled NUMBER(1) NOT NULL,
CONSTRAINT pk_tran_detail PRIMARY KEY (line_no), CONSTRAINT fk_tran_detail3
FOREIGN KEY (cocode,cccode) REFERENCES GL_Cost_Center, CONSTRAINT fk_tran_
detail4 FOREIGN KEY (cocode,coacode) REFERENCES GL_COA)
```

--ADD FOREIGN KEY

```
ALTER TABLE gl_tran_detail ADD CONSTRAINT fk_tran_detail2 FOREIGN KEY
(TRAN_NO) REFERENCES gl_tran_master(TRAN_NO) ON DELETE CASCADE ENABLE
```

--S6C-- TRANSACTION TABLE SEQUENCE

```
CREATE SEQUENCE gl_tran_master_seq MINVALUE 1 START WITH 1 INCREMENT BY 1
CACHE 20
CREATE SEQUENCE gl_tran_detail_seq MINVALUE 1 START WITH 1 INCREMENT BY 1
CACHE 20
```

--S6D-- TRIGGER TO POPULATE DEFAULT COST CENTER CODE FROM CHART OF ACCOUNTS (IF LEFT NULL IN VOUCHER)

```
CREATE OR REPLACE TRIGGER  "tran_detail_get_cost_center" BEFORE INSERT OR
UPDATE ON gl_tran_detail
FOR EACH ROW
DECLARE
  Vcccode varchar2(5);
BEGIN
  if :new.cccode is null then
    select cccode into Vcccode from GL_COA where cocode = :new.cocode and
    coacode = :new.coacode;
    :new.cccode := Vcccode;
  end if;
END;

ALTER TRIGGER  "TRAN_DETAIL_GET_COST_CENTER" ENABLE
```

Transaction data will be saved in two tables: `GL_TRAN_MASTER` and `GL_TRAN_DETAIL`. The master table contains header information for each voucher, while the details table carries transaction information. The two tables are linked together using a common key (`TRAN_NO`), following a one-to-many relationship in which a single voucher record in the master table can have multiple records in the details table. The `tran_detail_get_cost_center` trigger is used to populate default cost centers in the details table from the COA when no cost center is selected during voucher creation.

14.1 Create List of Values

Using Table 14-1, create two dynamic LOVs from scratch. You'll use the first LOV in the Transaction Details region to select financial accounts from the COA for each transaction. The second LOV will be used to fetch and create vouchers for the selected type.

Table 14-1. *Dynamic LOVs*

LOV	Query
COA Entry Level	SELECT coacode||'-'||coatitle d, coacode r FROM gl_coa WHERE coalevel=4 and cocode=(select cocode from gl_users where userid = :APP_USER) ORDER BY coacode
Voucher Types	SELECT vchtype d, vchcode r FROM gl_voucher ORDER BY vchtype

14.2 Create Pages

This segment will also comprise two pages, but here you will use the Form ➤ Master Detail Form option. The master page (42) will show header information from the master table, while the detail page (43) will have two regions: Enter Voucher and Transaction Details. The Enter Voucher region will receive header information, whereas the second region will be used to enter details of each transaction. Create the two pages using Table 14-2.

Table 14-2. *Page Attributes*

Page Type	Attribute	Value
Master Page	Table Owner	*Accept the displayed value*
	Table Name	GL_TRAN_MASTER
	Columns	*Select all columns*
	Primary Key Type	Select Primary Key Column(s)
	Primary Key Column 1	TRAN_NO
	Primary Key Source	Existing Sequence
	Sequence	GL_TRAN_MASTER_SEQ
	Include master row navigation	Yes (default)
	Include master report	Yes (default)
	Build Master Detail with	Edit detail as tabular form on same page
	Master Page Number	42
	Page Title	Vouchers
	Region Title	Vouchers
	Page Mode	Normal
	Breadcrumb	- do not add breadcrumb region to page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Transactions
Detail Page	Table Owner	*Accept the displayed value*
	Table Name	GL_TRAN_DETAIL
	Columns	*Select all columns*
	Primary Key Type	Select Primary Key Column(s)
	Primary Key Column 1	LINE_NO
	Primary Key Source	Existing Sequence
	Sequence	GL_TRAN_DETAIL_SEQ
	Detail Page Number	43
	Page Title	Voucher Details
	Master Region Title	Enter Voucher
	Detail Region Title	Transaction Details

14.3 Modify the Master Page (Page 42)

Click the Classic Report region called Vouchers and execute the following steps:

1. Replace the existing SQL query with the one that follows. When you select a voucher type from the select list (created in the next section), the report is refreshed using the conditions specified in the WHERE clause and displays vouchers related to the selected company, year, month, and type.

```
SELECT
             "GL_TRAN_MASTER"."TRAN_NO" "TRAN_NO",
             "GL_TRAN_MASTER"."COCODE" "COCODE",
             "GL_TRAN_MASTER"."COYEAR" "COYEAR",
             "GL_TRAN_MASTER"."COMONTHID"
             "COMONTHID",
             "GL_TRAN_MASTER"."VCHCODE" "VCHCODE",
             "GL_TRAN_MASTER"."VCHNO" "VCHNO",
             "GL_TRAN_MASTER"."VCHDATE" "VCHDATE",
             "GL_TRAN_MASTER"."VCHDESCRIPTION"
             "VCHDESCRIPTION",
             "GL_TRAN_MASTER"."CREATEDBY"
             "CREATEDBY",
             "GL_TRAN_MASTER"."CREATEDON"
             "CREATEDON",
             "GL_TRAN_MASTER"."VCHVERIFIED"
             "VCHVERIFIED",
             "GL_TRAN_MASTER"."VCHPOSTED"
             "VCHPOSTED",
             "GL_TRAN_MASTER"."CLOSING" "CLOSING"
FROM  "GL_TRAN_MASTER"
WHERE (("GL_TRAN_MASTER"."COCODE" = :P42_COCODE and
"GL_TRAN_MASTER"."COYEAR" = :P42_COYEAR and
                 "GL_TRAN_MASTER"."COMONTHID"
                 = :P42_COMONTHID and "GL_TRAN_
                 MASTER"."VCHCODE" = :P42_VCHCODE))
```

2. Expand the Columns node under the Vouchers region. Using drag and drop to arrange the report columns in this order: TRAN_NO, VCHVERIFIED, VCHPOSTED, VCHNO, VCHDATE, and VCHDESCRIPTION. Also, set the appropriate column headings (shown later in the chapter).

3. Set the Default Sequence attribute for the VCHNO column to 1 and set Direction to Ascending to sort the report on this column.

4. Set the Type attribute to Hidden Column for the COCODE, COYEAR, COMONTHID, VCHCODE, CREATEDBY, CREATEDON, and CLOSING columns.

14.4 Add Items (Page 42)

Using Table 14-3, create three hidden items on the master page to hold the company code, year, and month ID values. You fetch values for these items through individual SELECT statements. These values are forwarded through the Create button to the details page (page 43) to record vouchers in the proper company and period. The Select List item (P42_VCHCODE, listed last in Table 14-3) is added to display all voucher types. When you switch voucher types, the page is submitted to fetch vouchers related to the selected type.

Table 14-3. *Hidden Item Attributes*

Action	Attribute	Value
Create Page Item	Name	P42_COCODE
	Type	Hidden
	Value Protected	Yes (default)
	Region	Vouchers
	Source Type	SQL Query (return single value)
	SQL Query	SELECT cocode FROM gl_users WHERE userid = :app_user
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P42_COYEAR
	Type	Hidden
	Value Protected	Yes (default)
	Region	Vouchers
	Source Type	SQL Query (return single value)
	SQL Query	SELECT coyear FROM gl_users WHERE userid = :app_user
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P42_COMONTHID
	Type	Hidden
	Value Protected	Yes (default)
	Region	Vouchers
	Source Type	SQL Query (return single value)
	SQL Query	SELECT comonthid FROM gl_users WHERE userid = :app_user
	Source Used	Always, replacing any existing value in session state

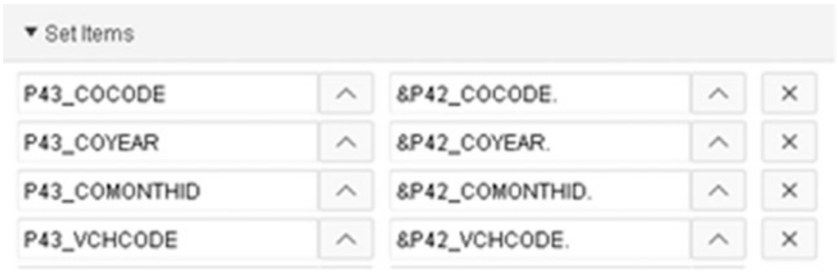
(*continued*)

Table 14-3. *(continued)*

Action	Attribute	Value
Create Page Item	Name	P42_VCHCODE
	Type	Select List
	Label	<b>Select Voucher Type:</b>
	Page Action on Selection	Submit Page *(page is refreshed with vouchers of the selected type)*
	Region	Vouchers
	Label Column Span	2
	LOV Type	Shared Component
	List of Values	VOUCHER TYPES

14.5 Modify Button (Page 42)

Modify the Create button on the master page. Set the Button Position attribute to Copy. In the Behavior section, click the Target attribute link. In the Link Builder dialog box, set the items as illustrated in Figure 14-1. Upon page submission, item values on the master page (preceded with the & symbol and terminated with a full stop) will be forwarded to the corresponding items on page 43 (specified under the Set Items column).



P43_COCODE	&P42_COCODE.
P43_COYEAR	&P42_COYEAR.
P43_COMONTHID	&P42_COMONTHID.
P43_VCHCODE	&P42_VCHCODE.

Figure 14-1. *Link Builder dialog box*

14.6 Modify the Detail Page (Page 43)

Execute the following set of steps to modify the details page:

1. Click the Transaction Details (Tabular Form) region and remove the default condition by setting Condition Type to – Select –. This tabular form was displayed only when P43_TRAN_NO carried some value. With this amendment, the form will always be visible.

2. In the Enter Voucher region, mark all items as Hidden except VCHNO, VCHDATE, and VCHDESCRIPTION. Add appropriate labels (Number, Date, and Description) to the three visible items. Also, set Template to Required, and set Value Required to Yes for these three items. These three items will accept voucher header information manually from users. All other items will have autogenerated values, as configured in the next couple of steps.

3. Set Default Type to PL/SQL Expression and PL/SQL Expression to V('APP_USER') for P43_CREATEDBY.

4. Set Default Type to PL/SQL Expression and PL/SQL Expression to SYSDATE for P43_CREATEDON.

5. Set Default Type to Static Value and Static Value to N, N, and 0 for P43_VCHVERIFIED, P43_VCHPOSTED, and P43_CLOSING, respectively.

6. Change the Type attribute of P43_VCHDESCRIPTION from Text Field to Textarea. Also, set Label Column Span to 2, Width to 130, Height to 2, and Maximum Length to 150.

7. In the Transaction Details region, set the Type attribute to Hidden Column (saves state) for the COCODE and RECONCILED page items.

8. Set the Compute Sum attribute to Yes for the VCHDR and VCHCR columns to display the total of these columns on the bottom.

9. Click the LINE_NO column. Set its Default Sequence to 1 and Direction to Ascending to sort the transactions in the tabular form on this column.

10. Modify the COCODE column. In the Default section, set its Type to Item and enter **P43_COCODE** in the Item attribute. Note that the database table `GL_TRAN_DETAIL` has a column labeled COCODE, which is added to the table to implement a constraint. This column will default to the value held in P43_COCODE, which was evaluated and forwarded by the master page in the previous section.

11. Modify the COACODE column. Switch its Type property from Text Field to Popup LOV (shows displays value). Set LOV Type to Shared Component, select COA ENTRY LEVEL for the list of values, and Width to 35. These changes will present the column as a Popup LOV, from where you can pick an account from the chart of accounts.

12. Modify the CCCODE column. Switch its Type property from Text Field to Popup LOV (shows displays value). Set LOV Type to Shared Component, select COST CENTERS for the list of values, and set Width to 12.

13. Modify the columns VCHDR, VCHCR, and RECONCILED. In the Default section, set the Type attribute to PL/SQL Expression and enter **0** in the PL/SQL Expression box. These settings will show zero as the default value in the former two columns. The zero value is stored in the RECONCILED column to mark every transaction initially as unreconciled. After reconciling a transaction with the bank (in Chapter 21), these default values will be replaced with 1.

14. Click the Attribute node (under Transaction Details) and set Number of Rows to 500 to display the number of entries on a single page. Scroll down toward the bottom. In the Break Formatting section, enter **Total** in the Report Sum Label attribute. At runtime, this will display the text (Total) at the bottom alongside the summed-up debit and credit figures.

14.7 Add/Modify Items

Using Table 14-4, add a Display Only item under the Enter Vouchers region on page 43. It is added to display the selected voucher type. This item is to be placed between the VCHCODE and VCHNO items. You assess the voucher type using the value held in the page item P43_VCHCODE, which was forwarded across; see Figure 14-1.

Table 14-4. *Display Only Item Attributes*

Action	Attribute	Value
Create Page Item	Item Name	P43_VCHTYPE
	Type	Display Only
	Label	<b>Voucher Type:</b>
	Sequence	55 *(to place it properly after the vchcode item)*
	Region	Enter Voucher
	Label Column Span	2
	Source Type	SQL Query (return single value)
	SQL Query	SELECT vchtype FROM gl_voucher WHERE vchcode=:P43_VCHCODE
	Source Used	Always, replacing any existing value in session state

The attributes specified in Table 14-5 are set to align the P43_VCHNO and P43_VCHDATE items horizontally with the Voucher Type item.

Table 14-5. *Alignment Attributes*

Action	Attribute	Value
Modify Item	Item Name	P43_VCHNO
	Start New Row	No
	Label Column Span	2
	Template	Required
	Width	10
	Value Required	Yes
	Maximum Length	10
	Condition Type	- Select - (in other words, no condition set for this item)
Modify Item	Item Name	P43_VCHDATE
	Start New Row	No
	Label Column Span	2
	Width	11 *(to hold 01-AUG-2015 format)*
	Maximum Length	11

14.8 Modify Validations on Page 43

Using Table 14-6, modify the ten default validations. Currently, these validations do not respond to the CREATE button when you create a new voucher.

Table 14-6. *Validation Modifications*

Validations	Attribute	Value
COCODE not null **COCODE must be numeric** **COACODE not null** **VCHDESCRIPTION not null** **VCHDR not null** **VCHDR must be numeric** **VCHCR not null** **VCHCR must be numeric** **RECONCILED not null** **RECONCILED must be numeric**	PL/SQL Expression	**:request in ('SAVE', '<u>CREATE</u>')** or :request like 'GET_NEXT%' or :request like 'GET_PREV%'

14.9 Add Validations to Page 43

Using Tables 14-7 to 14-10, add four validations to page 43. The first validation (mentioned in Table 14-7) checks for the existence of a voucher number and the presence of a valid voucher date. You cannot use the same number of the same type in the same company, year, and month. Suppose, for example, you are connected to the ABC & Company with January 2015 as your working period. If you try to create JV 1, which already exists in the database, then the system will prevent you from using the same number for the same voucher type. Of course, you can create this number in another period for the same type. The validation also keeps track of invalid dates. For instance, you cannot create vouchers related to February in the month of January. If this is required, then you need to change your working period. The validation will fire when you click any of the four buttons (Apply Changes, Create, Next, or Previous).

Table 14-7. *Validation to Check Voucher Number and Date*

Action	Attribute	Value
Create Validation	Name	Check Voucher Number and Date
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter14\Check Number Date.txt
	Error Message	Invalid voucher number and/or date
	Condition Type	PL/SQL Expression
	PL/SQL Expression	:request in ('SAVE','CREATE') or :request Like 'GET_NEXT%' or :request Like 'GET_PREV%'

The validation in Table 14-8 loops through the tabular form (Transaction Details) region to check for the existence of records. From the basic principles of double entry accounting, you must have at least two records in this section: one debit and another for credit.

Table 14-8. *Validation to Check Voucher Details*

Action	Attribute	Value
Create Validation	Name	Check Voucher Details
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter14\Check Voucher Details.txt
	Error Message	Enter data in the details section
	Condition Type	PL/SQL Expression
	PL/SQL Expression	:request in ('SAVE','CREATE') or :request Like 'GET_NEXT%' or :request Like 'GET_PREV%'

A transaction is said to be invalid if you input either zero or different values in the debit or credit columns or if you forget to enter a value into either of them. The next validation, shown in Table 14-9, is added to prevent these errors.

Table 14-9. *Validation to Check Debit/Credit Columns*

Action	Attribute	Value
Create Validation	Name	Check Debit/Credit
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter14\Check Debit Credit.txt
	Error Message	Enter positive amount either in Debit or Credit
	Condition Type	PL/SQL Expression
	PL/SQL Expression	:request in ('SAVE','CREATE') or :request Like 'GET_NEXT%' or :request Like 'GET_PREV%'

For a voucher to be valid, it must be balanced; in other words, there should be no difference between debit and credit amounts. The validation in Table 14-10 will check this situation and inform you, by showing you the difference, of any balance discrepancy.

Table 14-10. *Validation to Check Voucher Balancing*

Action	Attribute	Value
Create Validation	Name	Voucher Balancing
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter14\Voucher Balancing.txt
	Error Message	Voucher is not balanced
	Condition Type	PL/SQL Expression
	PL/SQL Expression	:request in ('SAVE','CREATE') or :request Like 'GET_NEXT%' or :request Like 'GET_PREV%'

14.10 Modify Process

Using Table 14-11, amend the following default processes. The first one is amended to assign the primary key (populated from sequences) to the page item P43_TRAN_NO. This is used in the next section to populate the `TRAN_NO` column in the Transaction Details tabular form. Without this modification, the values defined in the Transaction Details pane will not be propagated to the transaction details table. The second amendment is made to display vouchers related to the selected criteria. In the absence of this clause, all vouchers can be navigated through using the Next and Previous buttons, irrespective of company, year, month, and voucher type. The first two processes (Process Row of GL_TRAN_MASTER and ApplyMRU) are located on the Processing tab, while the last one (Get Next or Previous Primary Key Value) is located under the Pre-Rendering section in the Rendering tab. The PL/SQL Expression for the ApplyMRU process is modified to execute the process when either the Save or Create button is pressed. By default, the process applies to only the modified records.

Table 14-11. *Process Modifications*

Process	Attribute	Value
Process Row of GL_TRAN_MASTER	Return Key Into Item	P43_TRAN_NO
ApplyMRU	PL/SQL Expression	**:request in ('SAVE','CREATE')** or :request like 'GET_NEXT%' or :request like 'GET_PREV%'
Get Next or Previous Primary Key Value	Navigation Order Column	TRAN_NO
	Runtime Where Clause	COCODE=:P43_COCODE and COYEAR=:P43_COYEAR and COMONTHID=:P43_COMONTHID and VCHCODE=:P43_VCHCODE

14.11 Create Process

Using Table 14-12, add a process between Process Row process of `GL_TRAN_MASTER` and `ApplyMRU`. This process will add the value of the P43_TRAN_NO item into the third tabular form column.

Table 14-12. *Process to Populate TRAN_NO Column*

Action	Attribute	Value
Create Process	Name	Populate TRAN_NO in Transaction Details
	Type	PL/SQL Code

	PL/SQL Code	FOR i IN 1 .. apex_application.g_f02.COUNT LOOP
		apex_application.g_f03(i) := :P43_TRAN_NO;
		END LOOP;

	Sequence	15 *(between Process Row of GL_TRAN_MASTER and ApplyMRU)*
	Point	Processing

14.12 Control Buttons

As per general accounting standards, verified vouchers (Chapter 16) and system-generated closing vouchers (Chapter 29) must not be modified or deleted. Using Table 14-13, amend the default conditions specified for the buttons on page 43 to prevent these actions.

Table 14-13. *Button Modifications*

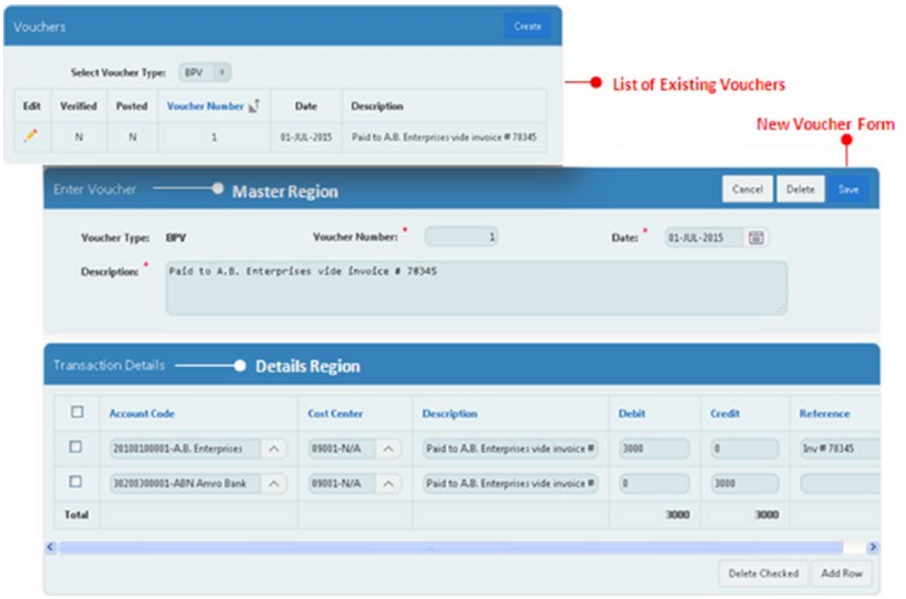
Action	Attribute	Value
Modify Buttons	Button Names	DELETE, SAVE and APPLY_CHANGES_MRD
	Condition Type	PL/SQL Function Body
	PL/SQL Function Body	Book_Code\Chapter14\Control Buttons.txt
Modify Buttons	Button Name	GET_PREVIOUS_TRAN_NO and GET_NEXT_TRAN_NO
	Condition Type	PL/SQL Function Body
	PL/SQL Function Body	Book_Code\Chapter14\Control Navigation Buttons.txt

14.13 Test Your Work

This exercise assumes you have completed all the previous chapters fully and have sufficient sample data entered. For instance, selecting a voucher type is mandatory; therefore, you must have created at least one. Similarly, you must also have created a company, year, and month and created a COA. Once you have all these segments in place, follow the next steps to create your first voucher. This is a payment voucher to pay a creditor (A.B. Enterprises) through a bank (ABN Amro), against their invoice number 78345.

1. Select Transactions from the main menu.
2. Select a voucher type on the master page (in my case, it is BPV-Bank Payment Voucher). Click the Create button. The selected voucher type will be displayed as a read-only item on the details page.
3. Enter **1** for the voucher number.
4. Select a date from the date picker. The date should fall within the period appearing on the top of this page.
5. Type **Paid to A.B. Enterprises against invoice # 78345** in the Description box.
6. After entering voucher master information, click the Add Row button to enter the transaction details.

7. Click the LOV button in the Account Code column, and select A.B. Enterprises from the pop-up list.
8. Now copy and paste the description from the main Description box (entered in step 5) into the current row's Description column.
9. Enter **3000** in the Debit column.
10. Enter **Inv # 78345** in the Reference column.
11. Add one more row using the Add Row button.
12. Select a bank account, such as ABN Amro Bank – 30200300001.
13. Paste the same description again for this row.
14. Enter **3000** in the Credit column. Figure 14-2 shows the completed voucher.
15. Click the Create button to save this voucher.



Select Voucher Type: BPV

Edit	Verified	Posted	Voucher Number	Date	Description
✎	N	N	1	01-JUL-2015	Paid to A.B. Enterprises vide invoice # 78345

Voucher Type: BPV
Voucher Number: 1
Date: 01-JUL-2015
Description: Paid to A.B. Enterprises vide invoice # 78345

☐	Account Code	Cost Center	Description	Debit	Credit	Reference
☐	20100100001-A.B. Enterprises	09001-N/A	Paid to A.B. Enterprises vide invoice #	3000	0	Inv # 78345
☐	30200300001-ABN Amro Bank	09001-N/A	Paid to A.B. Enterprises vide invoice #	0	3000	
Total				3000	3000	

Figure 14-2. Complete voucher

14.14 Summary

There are many other things covered in this chapter that need some testing on your part. Revisit these sections and give this segment a thorough test-run by trying different things, especially those related to the four validations. Once you have thoroughly tested the application by entering different types of transactions in different fiscal periods, move on to the next chapter where you will create a form to search the transactions you entered here.

CHAPTER 15

Search Transactions

The Transaction Search utility helps you locate transactions in a matter of seconds. There are numerous occasions when an accountant needs to search for a specific financial activity entered into a ledger. For example, the accountant may want to know the details of a payment made against invoice number 78345. In this chapter, you will create a search utility to locate a transaction. To search for transactions, a criteria list is provided along with a search box. You select a value from the criteria list (for example, Reference), then enter a value in the Search box (for example, **78345**), and finally hit the Search button. The utility searches for the provided value in the selected column and displays the matching records in an interactive report.

15.1 Create Page and Parameters Region

This segment will again be created manually using a blank page, followed by the addition of some page components. It will be invoked from the Utilities menu. Create the page and its components using Table 15-1.

Table 15-1. *Page and Component Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	53
	Name	Search Transaction
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Utilities

(*continued*)

Table 15-1. (*continued*)

Action	Attribute	Value
Create Region	Title	Search Parameters
	Type	Static Content
	Template	Standard
Create Button	Button Name	Search
	Label	Search
	Region	Search Parameters
	Button Position	Copy
	Hot	Yes
	Action	Submit Page
Create Page Item	Name	P53_CRITERION
	Type	Select List
	Label	<b>Criterion:</b>
	Region	Search Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	Static Values
	Static Values (Make sure that there are no spaces before or after the semicolon character.)	STATIC:Voucher Number;TM. VCHNO, Account Code;TD.COACODE, Account Title;COA.COATITLE, Debit;TD.VCHDR, Credit; D.VCHCR, Master Description;TM. VCHDESCRIPTION, Detail Description;TD. VCHDESCRIPTION, Reference;TD.VCHREFERENCE

(*continued*)

Table 15-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P53_SEARCH
	Type	Text Field
	Label	<b>Search:</b>
	Region	Search Parameters
	Start New Row	No
	Label Column Span	2
	Template	Required
	Width	100
	Value Required	Yes

The LOV defined in the select list (P53_CRITERION) has eight options. Each option comprises two values: a display value and a return value. The value placed in the display position is shown to users. When the user selects a value, the return value is what actually gets returned to the program. For example, when the user selects a voucher number from the list, the program will receive a return value of TM.VCHNO, which is the voucher number from the transaction master table. This value is then used in the `WHERE` clause of the SQL statement covered in the next section to fetch the required records.

15.2 Create an Interactive Report Region

The interactive report region created in Table 15-2 will show all the searched records beneath the parameters region. It is based on a `SELECT` query that joins multiple tables to provide complete information. The `WHERE` clause in this statement uses the value returned by the criterion select list via the `DECODE` function. Note that `COATITLE`, `VCHDESCRIPTION`, and `VCHREFERENCE` are character columns, so values in these columns are searched using the `LIKE` operator.

Table 15-2. Interactive Report Region

Action	Attribute	Value
Create Region	Title	Search Result
	Type	Interactive Report
	SQL Query	SELECT TM.TRAN_NO, TM.VCHDATE, VCH.VCHTYPE, TM.VCHNO, TD.COACODE, COA.COATITLE, TM.VCHDESCRIPTION MD, TD.VCHDESCRIPTION DD, TD.VCHDR, TD.VCHCR, TD.VCHREFERENCE FROM GL_COA COA, GL_VOUCHER VCH, GL_TRAN_MASTER TM, GL_TRAN_DETAIL TD WHERE TM.COCODE=TD.COCODE AND TM.COCODE= COA.COCODE AND TM.TRAN_NO=TD.TRAN_NO AND TM.VCHCODE=VCH.VCHCODE AND TD.COACODE= COA.COACODE AND TM.COCODE=(select cocode from gl_users where userid=:APP_USER) AND (decode(:P53_CRITERION,'TD.COACODE',TD. COACODE)=:P53_SEARCH OR decode(:P53_CRITERION,'COA.COATITLE',upper (COA.COATITLE)) **Like** upper(:P53_SEARCH) OR decode(:P53_CRITERION,'TD.VCHCR',TD. VCHCR)=:P53_SEARCH OR decode(:P53_CRITERION,'TD.VCHDR',TD. VCHDR)=:P53_SEARCH OR decode(:P53_CRITERION,'TD. VCHDESCRIPTION',upper(TD. VCHDESCRIPTION)) **Like** upper(:P53_SEARCH) OR decode(:P53_CRITERION,'TM.VCHDESCRIPTION', upper(TM.VCHDESCRIPTION)) **Like** upper(:P53_SEARCH) OR decode(:P53_CRITERION,'TD.VCHREFERENCE', upper(TD.VCHREFERENCE)) **Like** upper(:P53_SEARCH) OR decode(:P53_CRITERION,'TM.VCHNO',TM. VCHNO)=:P53_SEARCH) ORDER BY TM.VCHDATE
	Template	Standard

Add meaningful column headings (as shown later in the chapter in Figure 15-1) to the report by expanding the Columns node under the Search Result interactive report.

15.3 Add a Dynamic Action

Using Tables 15-3 and 15-4, add a dynamic action to enable a wildcard character (%) to be used to allow the searching of values in character columns. The true action fires when you select a criterion from the list. The dynamic action then places the text *%put search string between these symbols%* into the search box (P53_SEARCH) to inform users that the character search should be added in between the two percent signs. The false action (in other words, when a numeric criterion is selected) makes the search box empty. The two parameter values (criterion and searched value) are then used in the `WHERE` clause (in the previous section) to filter records in the `SELECT` statement.

Table 15-3. *Dynamic Action For Static Assignment*

Action	Attribute	Value
Create Dynamic Action	Name	Put Percent Sign
	Event	Change
	Selection Type	Item(s)
	Item(s)	P53_CRITERION
	Condition	in list
	Value	COA.COATITLE, TM.VCHDESCRIPTION, TD.VCHDESCRIPTION, TD.VCHREFERENCE
	Action (under Show)	Set Value
	Set Type	Static Assignment
	Value	%put search string between these symbols%
	Item (Under Affected Elements)	P53_SEARCH

Right-click the False node, and select Create False Action. Set the attributes in Table 15-4 for the False action.

Table 15-4. *False Action Attributes*

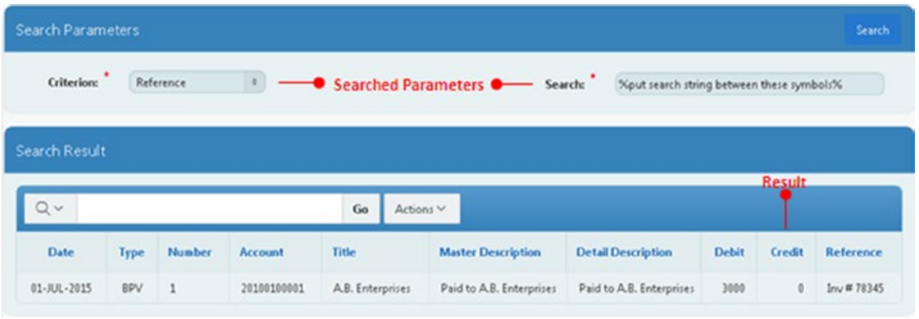
Attribute	Value
Action	Set Value
Set Type	Static Assignment
Value	*Leave Blank*
Selection Type	Item(s)
Item(s)	P53_SEARCH

15.4 Test Your Work

Invoke this page from the Utilities menu's Search Transaction option, and execute the following steps to search a transaction that you recorded in the previous chapter:

1. Select Reference from the Criterion list. The search box will prompt you to enter a value within % symbols. Do so by entering **78345** between these symbols and hit the Search button. You'll get the voucher information you entered in the previous chapter, as illustrated in Figure 15-1.

2. Switch criterion to Debit. Enter **3000** in the Search box, and click the Search button. Once again, the same record appears on your screen, but this time it is fetched using numeric parameters.



Date	Type	Number	Account	Title	Master Description	Detail Description	Debit	Credit	Reference
01-JUL-2015	BPV	1	20100100001	A.B. Enterprises	Paid to A.B. Enterprises	Paid to A.B. Enterprises	3000	0	Inv # 78345

Figure 15-1. *Search results*

15.5 Summary

Once your data piles up in the database, the Search Transaction utility helps you dig out a financial event from the data mine. In the next chapter, you will create a segment that protects data from manipulation.

CHAPTER 16

Vouchers Verification

The Vouchers Verification segment serves two purposes. First, it allows authorized staff to check the accuracy of business transactions, and second, it prevents verified vouchers from being modified or deleted. Its main interface provides a Parameters region, where you enter a range of dates and specify whether you want to see Unverified or Verified vouchers. The date parameters receive voucher creation dates (not the voucher date). The lower region of the page displays a list of vouchers based on the selected criteria. Each voucher's detail record starts with a link column, which calls another page where an authorized person can see a complete voucher with all its details. The page carries appropriate buttons to verify/unverify the voucher being shown.

16.1 Create Page and Parameters Region

Create a blank page and configure it using Table 16-1.

Table 16-1. *Page Attributes and Parameters Region*

Action	Attribute	Value
Create Blank Page	Page Number	94
	Name	Vouchers Verification
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Closing
Create Region	Title	Parameters
	Type	Static Content
	Template	Standard

(*continued*)

R. Ahmed, *Cloud Computing Using Oracle Application Express*,
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Table 16-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P94_FROM
	Type	Date Picker
	Label	<b>From</b>
	Region	Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	Source Type	PL/SQL Expression
	Item Source Value	SYSDATE
Create Page Item	Name	P94_TO
	Type	Date Picker
	Label	<b>To</b>
	Region	Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	Source Type	PL/SQL Expression
	Item Source Value	SYSDATE
Create Page Item	Name	P94_CRITERION
	Type	Radio Group
	Label	<b>Select:</b>
	Number of Columns	2
	Region	Parameters
	Label Column Span	2
	LOV Type	Static Values
	Static Values	STATIC:Unverified;N,Verified;Y
	Display Null Value	No
	Default Type	Static Value
	Static Value	N

(*continued*)

Table 16-1. *(continued)*

Action	Attribute	Value
Create Button	Button Name	Get
	Label	Get
	Region	Parameters
	Button Position	Copy
	Hot	Yes
	Action	Submit Page

The two date picker items are added to the page where users will specify a range of voucher creation dates. The purpose of using the Created On date column is to make it easier for the verifying person to call all vouchers entered on a specific date, irrespective of the financial period . For example, if the authorized person verifies all vouchers on daily basis, then that person will need to view a list of all vouchers created today. The radio group item is added to filter vouchers according to the selected criterion: Unverified or Verified. Once a voucher is marked as verified, it vanishes from the Unverified list and can be seen only by selecting the Verified option.

16.2 Create Interactive Report Region

The interactive report region in Table 16-2 is based on a SELECT statement. The region refreshes when a user clicks the Get button after choosing one option from the radio group. Note that this report is based on the CREATEDON column, which means that the user will have to put a voucher creation date, not the voucher date itself, in the two date boxes. For example, a voucher dated 01-JAN-2015 is created on January 2, 2015, and can be viewed in this report only when you enter **02-JAN-2015** in the date boxes. The Closing column in the transaction master table is a tag that is used by the application to identify year-end vouchers. A value of 1 in this column signifies that the voucher is a system-generated closing voucher and is not user-modifiable. See Chapter 29 for more on closing vouchers.

Table 16-2. *Interactive Report Region Attributes*

Action	Attribute	Value
Create Region	Title	Vouchers Verification
	Type	Interactive Report

	SQL Query	SELECT * FROM gl_tran_master
		WHERE cocode=(select cocode from gl_users where
		        Userid = :APP_USER) AND
		        createdon between :P94_FROM AND :P94_
		        TO AND
		        vchverified=:P94_CRITERION AND **closing**=0
		ORDER BY vchdate

	Template	Standard

After creating the region, amend the interactive report region as follows:

1. Hide all columns except VCHNO, VCHDATE, VCHDESCRIPTION, CREATEDBY, and CREATEDON. Also add the appropriate headings to these visible columns, as shown in Figure 16-1 later in the chapter.

2. Create a link in the TRAN_NO column. This link will open page 95 to display the selected voucher, where you can mark it as verified and can even reverse it. The Set Items section is populated with some key values that are passed to the verification page for further processing. Recall that for page 42 (Vouchers), you created three hidden items (P42_COCODE, P42_COYEAR, and P42_COMONTHID) and stored the appropriate values in these items through SQL statements for this purpose. You didn't do this for page 94 because in page 42 hidden items were created to add conditions to the wizard-generated report query. Here, you do not need these items as you have already placed filters in the WHERE clause of the interactive report's SQL query. The items (P95_COCODE, P95_COYEAR, P95_COMONTHID, and P95_VCHCODE) on page 95 (coming up next) are populated with values from the interactive report items: &P94_COCODE., &P94_COYEAR., &P94_COMONTHID., and &P94_VCHCODE. Set the attributes mentioned in Table 16-3 to create the link.

Table 16-3. *Link Attributes*

Action	Attribute	Value	
Modify Column	Column Name	TRAN_NO	
	Type	Link	
	Heading	Call	
	Column Alignment	Center	

	Target	Type = Page In This Application
		Page = 95	

		Set Items	
		Name	**Value**
		P95_TRAN_NO	#TRAN_NO#
		P95_COCODE	&P94_COCODE.
		P95_COYEAR	&P94_COYEAR.
		P95_COMONTHID	&P94_COMONTHID.
		P95_VCHCODE	&P94_VCHCODE.
		Clear Cache = 95	
	Link Text	<img src="#IMAGE_PREFIX#magnifying_glass_white_bg.gif" alt="">	

16.3 Create Verification Page

The main vouchers verification page will be created from the Voucher Details page you created in Chapter 14. Edit page 43, click the Create menu , and select the option Page as Copy. Follow the wizard and set the attributes listed in Table 16-4.

Table 16-4. *Verification Page Attributes*

Attribute	Value
Create a page as a copy of	Page in this application
Copy from Page	43. Voucher Details
Copy to New Page Number	95
New Page Name	Vouchers Verification Page
Breadcrumb	- do not use breadcrumbs on page -
New Names Page	*Accept all the default new values*
Navigation Preference	Identify an existing navigation menu entry for this page
Existing Navigation Menu Entry	Closing

A copy of the voucher details page is created with a new ID (95). The new page will function just like the one it is copied from. Let's modify it to restrict some of its functions and add some new components so that it can perform the intended task of verification.

16.4 Modify, Delete, and Create Page Buttons

The first amendment mentioned in Table 16-5 is being made on page 95 to handle the application flow when the Cancel button is clicked. When clicked, this button will turn the flow back to page 94 instead of 42.

Table 16-5. *Cancel Button Attributes*

Action	Attribute	Value
Modify Button	Button Name	CANCEL
	Target Page	94

Delete the five buttons mentioned in Table 16-6 because they are no longer applicable to this segment.

Table 16-6. Button Deletions

Action	Attribute	Value
Delete Buttons	Button Name	DELETE, SAVE, CREATE, APPLY_CHANGES_MRD, APPLY_CHANGES_ADD

Now add two new buttons, as listed in Table 16-7. The first button will be displayed for vouchers that are yet to be verified (P95_VCHVERIFIED=N), while the second one will appear for those vouchers that are already marked as verified.

Table 16-7. New Buttons Attributes

Action	Attribute	Value Button 1	Value Button 2
Create Buttons	Button Name	Verify	Unverify
	Label	Verify	Unverify
	Region	Enter Voucher	Enter Voucher
	Button Position	Copy	Copy
	Hot	Yes	Yes
	Action	Submit Page	Submit Page
	Condition Type	Item = Value	Item = Value
	Item	P95_VCHVERIFIED	P95_VCHVERIFIED
	Value	N	Y

■ **Tip** To set the same attribute value for multiple page items, select all items using Ctrl+click and set the desired value.

16.5 Modify Page-Rendering Process

On the Rendering tab, expand the Pre-Rendering node and click the process named Get Next or Previous Primary Key Value. Replace its existing Runtime Where clause using Table 16-8 to fetch and display vouchers according to the specified criteria.

Table 16-8. Modify Page-Rendering Process

Action	Attribute	Value
Modify Process	Name	Get Next or Previous Primary Key Value
	Runtime Where Clause	COCODE=:P95_COCODE and createdon between :P94_FROM and :P94_TO and vchverified=:P94_CRITERION and CLOSING=0

16.6 Delete Validations

Delete all validations from this page. Since all the validations on this page relate to the voucher entry segment, they are not applicable to the verification process.

16.7 Delete Processes

Just like validations, you do not need the defined six processes for this segment. So, delete all these processes.

16.8 Add Processes

Using Table 16-9, add two processes. As the name implies, the first process (Verify) marks a voucher as verified in the transaction master table. The second one is just the opposite and is added to reverse the verification process. Once a voucher is marked as verified, normal users cannot amend or delete it unless an authorized person reverses its state to unverified. Note that since each transaction number (TRAN_NO) is generated uniquely and belongs to a particular company, no more comparisons are needed in the UPDATE statement's WHERE clause.

Table 16-9. *Process Attributes*

Action	Attribute	Value
Create Process	Name	Verify
	Type	PL/SQL Code
	PL/SQL Code	update gl_tran_master set vchverified='Y' where tran_no=:P95_TRAN_NO;
	Point	Processing
	When Button Pressed	Verify
Create Process	Name	Unverify
	Type	PL/SQL Code
	PL/SQL Code	update gl_tran_master set vchverified='N' where tran_no=:P95_TRAN_NO;
	Point	Processing
	When Button Pressed	Unverify

16.9 Handle Branches

Remove the first branch named Go To Page 95 with the invalid When Button Pressed value. Set the When Button Pressed attribute to GET_NEXT_TRAN_NO and GET_PREVIOUS_TRAN_NO, respectively, for the next two branches, also named as Go To Page 95.

Using Table 16-10, add a new branch. This branch is added to page 95 to move around vouchers of the selected criteria. Without this, when you click the Verify button, the voucher is marked as verified, and the Unverified button becomes visible. In a situation like this, you cannot verify subsequent vouchers in one go and then move back to select the next one manually. Once in place, the branch keeps you on the same page with the next record fetched using a value (&P95_TRAN_NO_NEXT.) held in the corresponding page item (P95_TRAN_NO) specified in the Set Items section.

Table 16-10. *Branch Attributes*

Action	Attribute	Value	
Create Branch	Name	Stay on this page	
	Point	After Processing	
	Type	Page or URL (Redirect)	

	Target	Type = Page In This Application
		Page = 95	

		Set Items	
		Name	**Value**
		P95_TRAN_NO	&P95_TRAN_NO_NEXT.
	Condition Type	Request is contained in Value	
	Value	Verify,Unverify	

16.10 Test Your Work

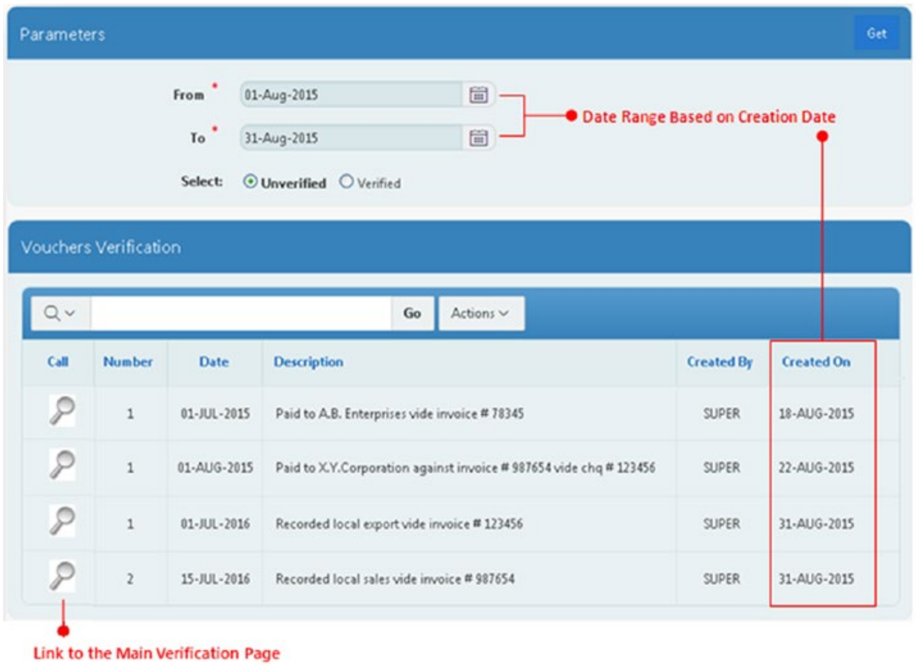
Execute the following steps to test this segment, which you can invoke from the Closing menu:

1. Select a date range in which you entered vouchers (see Figure 16-1).
2. With the Unverified option selected, hit the Get button. The Vouchers Verification region will be populated with all unverified vouchers.
3. Click the Call link for a voucher to bring up page 95 with all the details of the selected voucher.

4. Click the Verify button on this page (that is, page 95). The selected voucher will be marked as verified, and the next voucher will come up automatically for verification.

5. Click the Cancel button. Select the Verified option from the Parameters region and click Get again to have a list of all the vouchers you just verified.

6. Go to Select menu (from the main menu), and select the appropriate period for which you created the previously verified vouchers. Select Transactions from the main menu followed by the type of voucher you just verified. The Verified column on this page should now be displaying Y for all the verified vouchers. Click the Edit link for a verified voucher to open its details. Note that all the buttons, except Cancel and Add Row, have disappeared. This is because of the condition that you implemented in Chapter 14 (see Table 14-13), which says that you can hide all buttons if a voucher either is marked as verified or is an autogenerated closing voucher, which you'll create in Chapter 29.


Parameters
Get
Date Range Based on Creation Date
Vouchers Verification
Go
Actions
Link to the Main Verification Page

From: 01-Aug-2015
To: 31-Aug-2015
Select: [✓ Unverified] Verified

Call	Number	Date	Description	Created By	Created On
	1	01-JUL-2015	Paid to A.B. Enterprises vide invoice # 78345	SUPER	18-AUG-2015
	1	01-AUG-2015	Paid to X.Y.Corporation against invoice # 987654 vide chq # 123456	SUPER	22-AUG-2015
	1	01-JUL-2016	Recorded local export vide invoice # 123456	SUPER	31-AUG-2015
	2	15-JUL-2016	Recorded local sales vide invoice # 987654	SUPER	31-AUG-2015

Figure 16-1. *Voucher verification*

16.11 Summary

In this chapter, you created a mechanism that not only ensures the accuracy of transactions but also prevents data manipulation. After verifying a voucher, a user can print its hard copy, which comes next.

CHAPTER 17

Vouchers Report

The application enables you to make hard copies of vouchers. Using this feature you can print either a single voucher or multiple vouchers at once. Note that the output format for all the reports created in this application will be PDF. To get these PDFs, you must have access to a print server, such as Oracle BI Publisher. As of this writing, the online APEX development environment supports PDF printing. You will use Microsoft Word to create report templates in this book (I used Word 2003). In addition, you need Oracle BI Publisher Desktop to prepare the report templates, for which you might be asked to install Java Runtime Edition (JRE) and Dot Net Framework (in my case, it was `jre-6u11-windows-i586-p-s.exe` and `NetFx20SP1_x86.exe`). To begin with, you have to create a parameters form to specify the criteria used to produce the hard-copy report.

17.1 Create a List of Values

Using Table 17-1, create a dynamic LOV from scratch. It contains a list of users and will be used in the next section to print only those vouchers that were recorded by the user selected from the list.

Table 17-1. *Dynamic LOV Attributes*

Action	Attribute	Value
Create LOV	Name	Users
	Type	Dynamic
	Query	SELECT userid d, userid r FROM gl_users WHERE cocode=(select cocode from gl_users where userid = :APP_USER)

17.2 Create the Parameters Form

Create a blank page and follow the instructions in Table 17-2 to add parameter components.

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***Table 17-2.** Parameters Form Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	71
	Name	Vouchers Report
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Reports
Create Region	Title	Vouchers Report
	Type	Static Content
	Template	Standard
Create Page Item	Name	P71_VCHCODE
	Type	Select List
	Label	<b>Voucher Type</b>
	Region	Vouchers Report
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	Shared Component	Voucher Types
	Display Null Value	No
Create Page Item	Name	P71_VCHDATEFROM
	Type	Date Picker
	Label	<b>Voucher Date</b>
	Region	Vouchers Report
	Label Column Span	2
	Template	Required
	Value Required	Yes
Create Page Item	Name	P71_VCHDATETO
	Type	Date Picker
	Label	*Clear Label Box*
	Region	Vouchers Report
	Label Column Span	2
	Value Required	Yes

(*continued*)

Table 17-2. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P71_CREATEDFROM
	Type	Date Picker
	Label	<b>Creation Date</b>
	Region	Vouchers Report
	Label Column Span	2
	Template	Required
	Value Required	Yes
	Default Type	PL/SQL Expression
	PL/SQL Expression	SYSDATE
Create Page Item	Name	P71_CREATEDTO
	Type	Date Picker
	Label	*Clear Label Box*
	Region	Vouchers Report
	Label Column Span	2
	Value Required	Yes
	Default Type	PL/SQL Expression
	PL/SQL Expression	SYSDATE
Create Page Item	Name	P71_VCHNOFROM
	Type	Text Field
	Label	<b>Voucher Number</b>
	Region	Vouchers Report
	Label Column Span	2
	Template	Required
	Value Required	Yes
	Default Type	Static Value
	Static Value	1 *(from minimum voucher number)*
Create Page Item	Name	P71_VCHNOTO
	Type	Text Field
	Label	*Clear Label Box*
	Region	Vouchers Report
	Label Column Span	2
	Value Required	Yes
	Default Type	Static Value
	Static Value	9999999999 *(to maximum voucher number)*

(*continued*)

Table 17-2. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P71_USERID
	Type	Select List
	Label	<b>Created By</b>
	Region	Vouchers Report
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	List of Values	Users
	Display Null Value	No
	Default Type	PL/SQL Expression
	PL/SQL Expression	V('APP_USER') *(show id of the logged in user)*
Create Button	Button Name	Print
	Label	Print
	Region	Vouchers Report
	Button Position	Copy
	Hot	Yes
	Action	Submit Page

17.3 Create Report Query

A report query, as the name suggests, is a `SELECT` statement that fetches records according to the specified parameters. This query is then associated with a report layout to print fetched records in a desired format. Create a report query using the following steps:

1. Go to Shared Components and click the Report Queries link located in the Reports section.
2. Click the Create button to create a new query.
3. Type **vouchers_report** in the Report Query Name box, set Output Format to PDF, set View File As to Attachment, and then click Next.
4. Copy and paste the SQL query contained in the `Book_Code\Chapter17\Report Query.txt` file and click Next.

5. Select the XML Data option for Data Source for Report Layout to export your report definition as an XML file. This file contains the data fetched using the previous `SELECT` statement.

6. Click the Download button (on the same Download Definition page), click the Save File option in the resulting dialog box, and click OK. This will save an XML file (`vouchers_report.xml`) to your local hard drive.

7. Click the Create Report Query button.

8. On the Confirm page, click the Test Report button. In the resulting pop-up dialog box, select Open with Adobe Acrobat option, and click OK. Since the report is based on several bind variables (whose values will be passed on to the query from the page 71 parameters), a blank generic PDF will be displayed at this stage.

9. Click the Create button to finish the wizard.

17.4 Download and Install BI Publisher Desktop

BI Publisher provides client-side tools that aid in building and testing layout templates. This consists of a plug-in to Microsoft Word for building RTF templates. You can download it from `www.oracle.com/technetwork/middleware/bi-publisher/downloads/index.html`.

Download the software using the link BI Publisher Desktop 10.1.3.4.1 for Windows (123 MB) and install it on your PC using the `.exe` file. Once the installation completes, you'll see the BI Publisher plug-in as a menu item in Microsoft Word. In newer Microsoft Word versions, it will be placed under the main Add-Ins menu. Note that I have provided the link that I tested myself. There might be some new versions of BI Publisher Desktop available when you access the download page. It will be feasible to go with the tested version first.

17.5 Create Report Template in Microsoft Word

Perform the following steps in Microsoft Word to create a template for the vouchers report. For your convenience, I have provided both XML and RTF files with the book's code.

1. Select an A4 size page and set the margins.

2. From the Data ribbon (under the Oracle BI Publisher main menu), select Load XML Data, as shown in Figure 17-1. In some Word versions, it is listed as Sample XML.

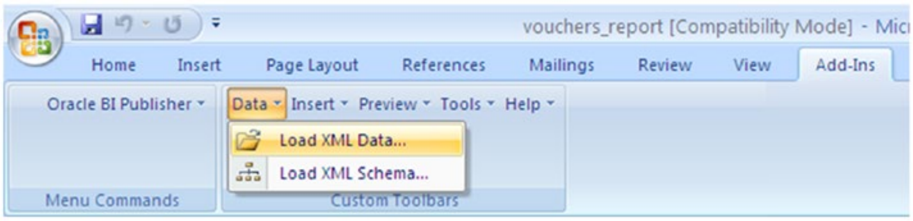


Figure 17-1. *Load XML Data menu item*

3. Select vouchers_report.xml and click Open to load the XML file you downloaded in the Create Report Query section. The message "Data Loaded Successfully" will appear. Click OK.
4. Select Insert and then choose the option Table Wizard (as shown in Figure 17-2) to add a table. This table will be used to output voucher details. Set Report Format to Table and click Next. On the next form, set Data Set to DOCUMENT/ROWSET/ROW. Click Next again.

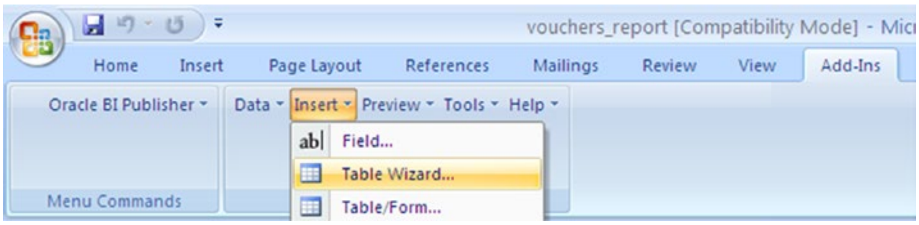


Figure 17-2. *Table Wizard menu item*

5. Move the Vchno, Coacode, Coatitle, Cccode, Cctitle, Vchdr, Vchcr, and Vchreference fields to the right pane, as illustrated in Figure 17-3. Click Next.

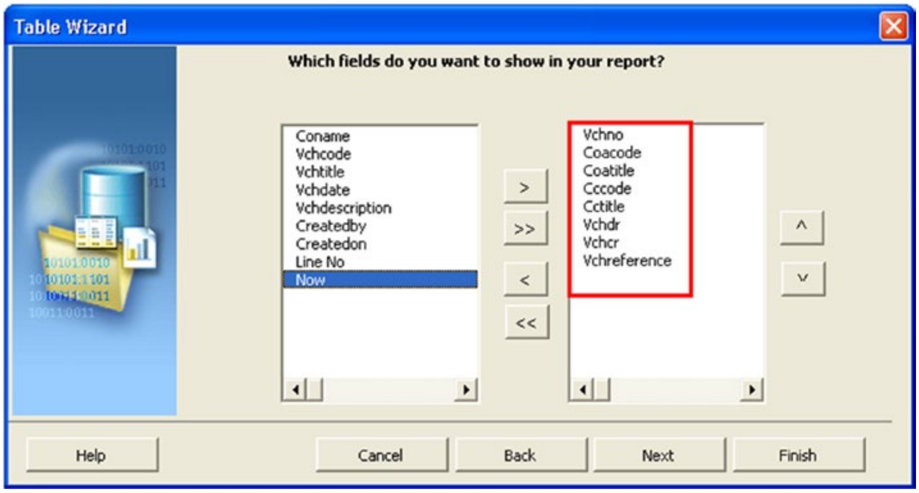


Figure 17-3. *Moving the fields*

6. Select Vchno in Group By to group records according to voucher number. Click Next and then do not select any field for Sort By. Click Next once more and then add appropriate labels, as shown in Figure 17-5 later in this chapter.

7. Click Finish.

17.6 Template Formatting

Follow these steps to format the template:

1. Double-click the group field titled "group ROW by VCHNO." On the Properties tab, set the Break attribute to Page. This will print each new voucher on a separate page. Click OK.

2. Select the Insert ribbon and select Field. Select the CONAME field and click the Insert button to add this field to the next row just after the group "group Row by VCHNO." You can also add the logo (`logo.jpg` is provided with the book's source code) just before the company name.

3. Add the VCHTITLE field under CONAME to print the voucher type under the company name.

4. Add the VCHNO field and add the label Voucher Number in front of it.

5. Add the label Printed on: and append the NOW field to it. The field (NOW) contains current timestamp.

6. Add the VCHDATE field using the instructions in step 2. Enter **Voucher Date** as its label.

7. Add the VCHDESCRIPTION field and put a label on it. Click Change.

8. Double-click the first COACODE table column labeled Account. In BI Publisher's Properties dialog, click the Advanced tab. Append **COATITLE** to the existing code so that it looks like this:

   <?COACODE?>-<?COATITLE?>

   Click OK. This expression will concatenate an account code and its corresponding title in the report.

9. Delete the column COATITLE.

10. Repeat the previous two step to join the CCCODE and CCTITLE (cost center code and title) fields.

11. Double-click VCHDR. Set its type to Number and its format to #,##0.00. Using the standard alignment tool in Microsoft Word, right-align the field. Repeat this step for VCHCR.

12. Add a blank row (by pressing the Enter key) before the page "breakend ROW by VCHNO." Click Insert and then select Field. In the Field dialog box, select VCHDR. From the Calculation list, select sum, select On Grouping, and click Insert. Repeat this step for VCHCR. Insert a label of **Total** and then format and align the two fields as shown in the template. This step will add a new row (just after the last transaction) to display the sum of the debit and credit columns.

13. Add the fields CREATEDBY and CREATEDON, as shown in Figure 17-4, to print who created the voucher along with its creation date.

14. Click the View menu and select Header and Footer. Put the cursor in the Footer section. From Insert Auto Text, select Page X of Y to print the page number on the bottom of each page. In the latest versions of Word, it is located under the menu Insert ➤ Page Number ➤ Bottom of Page. Figure 17-4 shows the completed report template.

15. Save the report to your hard drive as `vouchers_report` and select Rich Text Format (RTF) as its type.

16. Close Microsoft Word.

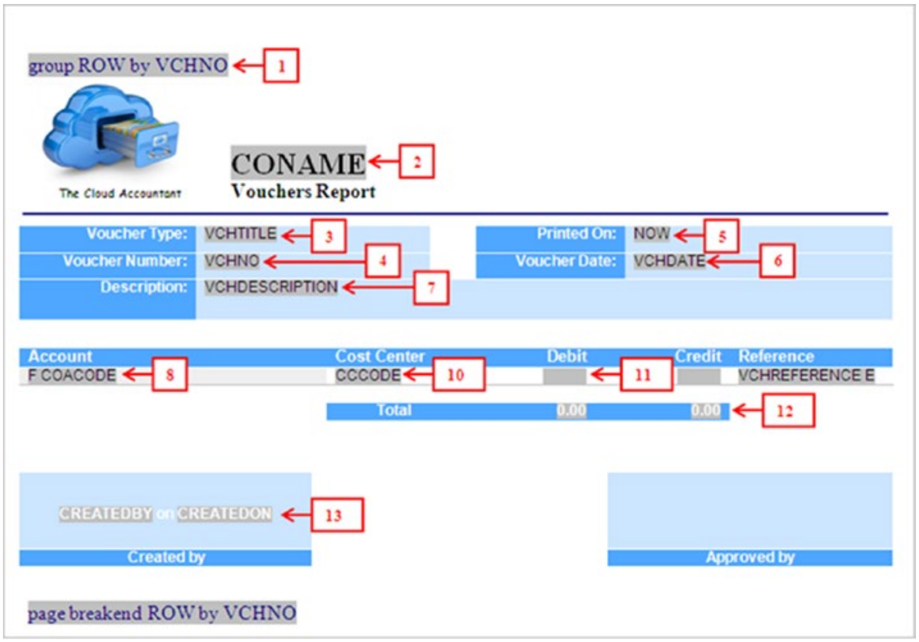


Figure 17-4. *Report template, with step numbers*

■ **Note** For your convenience I have provided a completed template (`vouchers_report.rtf`) in the `Chapter17` folder in the downloaded code.

17.7 Create the Report Layout

After creating the report template, the next step is to upload it to APEX. To do so, follow these steps:

1. Go to Shared Components and select Report Layouts (in the Reports section).
2. Click Create to upload a new layout.
3. Select Named Columns (RTF) and click Next.
4. Set Layout Name to `vouchers_report`, Report Layout File to `vouchers_report.rtf` (select the file using the browse button), and click the Create Layout button.

17.8 Attach the Report Layout to Report Query

Your report template is uploaded, so now you need to attach this layout to the corresponding query you defined in the Create Report Query section. Execute the following steps for this:

1. Go to Shared Components and select Report Queries.
2. Click the vouchers_report query. In Report Query Attributes, switch Report Layout from Use Generic Report Layout to vouchers_report. Click the Apply Changes button. This way, the APEX engine will use `vouchers_report.rtf` to display the result returned by the report query.

17.9 Send the Print Request

Edit page 71 and create a branch listed in Table 17-3 to send a print request when the Print button is clicked. Go to the Processing tab, right-click the After Processing node, and select Create Branch from the context menu. Set the attributes in in Table 17-3 for the new branch.

Table 17-3. *Branch Attributes*

Action	Attribute	Value
Create Branch	Name	Run Vouchers Report
	Point	After Processing
	Type	Page or URL (Redirect)

	Target	Type: Page in this Application
		Page: 0
		Request (under Advanced section):
		PRINT_REPORT=vouchers_report

	When Button Pressed	Print

■ **Note** You must use the same name and case for Report Query, Layout, and Branch Request or you'll get an error while printing the PDF. For instance, use **vouchers_report** for all three in the current scenario. Also, ensure that there is no space in the print request (`PRINT_REPORT=vouchers_report`) or you'll get an "ORA-22275: invalid LOB locator specified" error while printing the PDF report.

17.10 Create Validation

The validation created in Table 17-4 will check the data for the existence of the provided criteria.

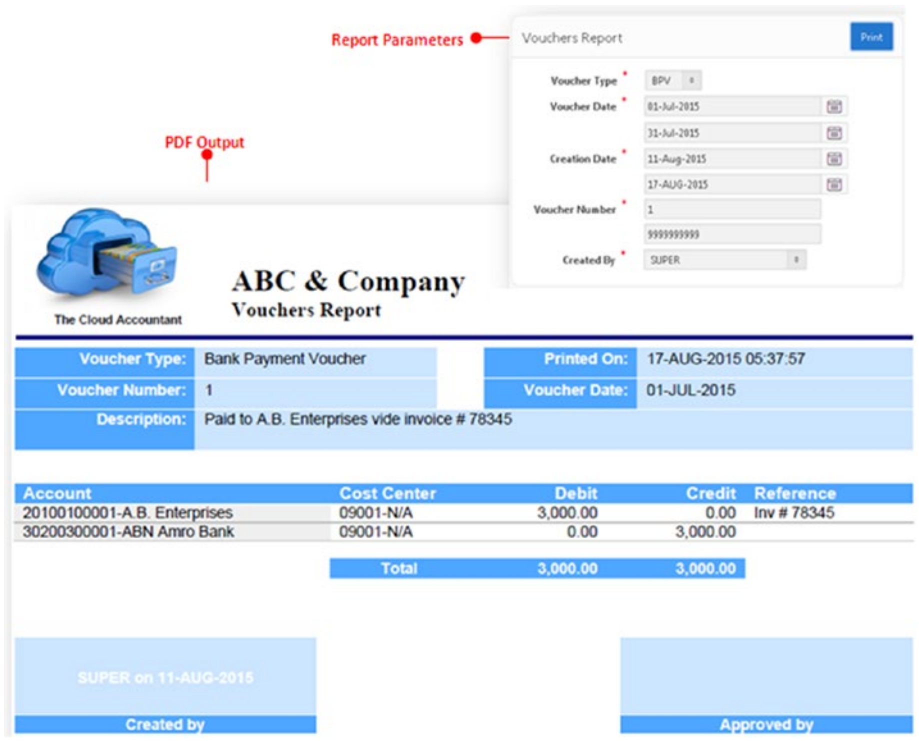
Table 17-4. *Validation Attributes*

Action	Attribute	Value
Add Validation	Name	Check Data
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter17\Check Data.txt
	Error Message	No data found
	When Button Pressed	Print

17.11 Test Your Work

Suppose that right now you have just one voucher that you created in Chapter 14. Let's fill in the parameters form (as illustrated in Figure 17-5) to see its printed version, also illustrated in Figure 17-5.

1. Click the Vouchers option (under Reports) in the Main Menu to open page 71, Vouchers Report.
2. Select BPV or the type you used when you created the voucher in Chapter 14.
3. Also select the same date you entered there in both Voucher Date boxes.
4. It's good if you recall the date you entered that voucher. If you can't, then select a long range for Creation Date.
5. Enter **1** in both Voucher Number boxes, or leave them to their default minimum and maximum values.
6. Select the ID of the user who entered that voucher and click the Print button. This should bring up a pop-up window to either open or save the PDF report. Choose either of these options and take a look at the printed version of the voucher.



Vouchers Report

Voucher Type *	BPV
Voucher Date *	01-Jul-2015
	31-Jul-2015
Creation Date *	11-Aug-2015
	17-AUG-2015
Voucher Number *	1
	999999999
Created By *	SUPER

ABC & Company
Vouchers Report

Voucher Type:	Bank Payment Voucher	Printed On:	17-AUG-2015 05:37:57
Voucher Number:	1	Voucher Date:	01-JUL-2015
Description:	Paid to A.B. Enterprises vide invoice # 78345		

Account	Cost Center	Debit	Credit	Reference
20100100001-A.B. Enterprises	09001-N/A	3,000.00	0.00	Inv # 78345
30200300001-ABN Amro Bank	09001-N/A	0.00	3,000.00	
	Total	3,000.00	3,000.00	

SUPER on 11-AUG-2015	
Created by	Approved by

Figure 17-5. *Printing a report*

17.12 Summary

Printed copies of vouchers are kept in folders along with supporting documents (bills, invoices, and so on) for future referencing. The next chapter discusses another significant financial report called Ledger.

CHAPTER 18

Ledger Report

A ledger report is a report that shows all financial activities performed in an account. In this application, it consists of seven columns, as illustrated later in the chapter in Figure 18-1. When a voucher is saved, all transactions you define in it are posted to the relevant ledger accounts with the respective debit and credit figures. The ledger report shows accounts with their transactions and balances. To generate this report, you use the Ledger Report Parameters form, where you specify the duration and the range of accounts you want to browse. As you can see, the parameter form has two buttons: the Display button is used to produce an onscreen view of the ledger report, while the Print button produces a hard copy. A useful ability of the report is that it contains a link for viewing the source voucher. This link will be created on the Voucher Date column.

18.1 Create Page and Parameters Form

The Ledger report segment will be created using a blank page containing two regions, as listed in Table 18-1. The first region will receive report parameters, and the second one (to be created in the next section) will show the ledger report onscreen. You will add two pop-up LOVs to the parameter form. Using these LOVs, users will select financial accounts from the COA. Note that the COA Entry Level LOV will show only transaction-level accounts (in other words, level 4 accounts).

***Table 18-1.** Page and Parameters Form Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	72
	Name	Ledger Report
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Reports

(*continued*)

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DOI 10.1007/978-1-4842-2502-8_18

Table 18-1. (*continued*)

Action	Attribute	Value
Create Region	Title	Ledger Report Parameters
	Type	Static Content
	Template	Standard
Create Page Item	Name	P72_FROM
	Type	Date Picker
	Label	<b>From</b>
	Region	Ledger Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	Source Type	SQL Query (return single value) *(select fiscal year's starting date)*
	SQL Query	SELECT pfrom From gl_fiscal_year WHERE cocode=(select cocode from gl_users where userid = :APP_USER) AND coyear=(select coyear from gl_users where userid = :APP_USER) AND comonthid=1
	Source Used	Only when current value in session state is null
Create Page Item	Name	P72_TO
	Type	Date Picker
	Label	<b>To</b>
	Region	Ledger Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	Source Type	SQL Query (return single value) *(select fiscal year's closing date)*
	SQL Query	SELECT pto FROM gl_fiscal_year WHERE cocode=(select cocode from gl_users where userid = :APP_USER) AND coyear=(select coyear from gl_users where userid = :APP_USER) AND comonthid=12
	Source Used	Only when current value in session state is null

(*continued*)

Table 18-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P72_ACCOUNTFROM
	Type	Popup LOV
	Label	<b>From Account</b>
	Region	Ledger Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	List of Values	COA Entry Level
Create Page Item	Name	P72_ACCOUNTTO
	Type	Popup LOV
	Label	<b>To Account</b>
	Region	Ledger Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	List of Values	COA Entry Level
Create Button	Button Name	Display
	Label	Display
	Region	Ledger Report Parameters
	Button Position	Copy
	Action	Submit Page
Create Button	Button Name	Print
	Label	Print
	Region	Ledger Report Parameters
	Button Position	Copy
	Action	Submit Page

18.2 Create an Interactive Report Region

Using Table 18-2, create an interactive report region to produce the onscreen version of the ledger report. The `SELECT` statement used in this report comprises two subqueries joined together using a `UNION ALL` set operator. The first subquery calculates opening balances of accounts by summing up all debit and credit figures recorded before the From date, specified in the P72_FROM date picker item. The second subquery fetches all transactions recorded between the two selected dates, inclusive. These are the transactions that you want to see in the ledger report. The queries also contain filters to process only those accounts selected in the two pop-up lists.

Table 18-2. *Interactive Report Region*

Action	Attribute	Value
Create Region	Title	Ledger
	Type	Interactive Report
	SQL Query	Book_Code\Chapter18\IR SQL Query 18.2.txt
	Template	Standard

18.3 Formatting Ledger Report

Execute the following steps to format the Ledger interactive report:

1. Set the Type attribute to Hidden Column for both the `VCHCODE` and `TRAN_NO` columns.
2. Modify the `VCHDR`, `VCHCR`, and `BALANCE` columns by applying a format mask ($5,234.10) to all three of them.
3. Add appropriate headings to all columns, as shown in Figure 18-1.
4. Run this segment from the Ledgers menu under the Reports menu. Select the date you entered for the first voucher you created in Chapter 14 in both date boxes, or specify a long range to fetch that transaction. Also select account of A.B. Enterprises (the account you selected in that voucher) in both pop-up LOVs, and hit the Display button.
5. Click the Actions menu. Select Format followed by the Sort option. Select the columns in this order: `COACODE` (Code), `VCHDATE` (Voucher Date), and `VCHNO` (Voucher Number). Keep Direction as Ascending and Null Sorting as Default. This step will sort the interactive report first on account codes, then on voucher dates, and finally on voucher numbers. The new column names, appearing within parentheses, were provided in step 3.

6. Click the Actions menu again. Select Format and then Control Break. Select COACODE (Code) in the first row and COATITLE (Title) in the second row. Click Apply. This action will place a control break to display each account separately.

7. Click the Actions menu. Select Format and then Highlight. Set the highlight rule Name to Opening Balance, Highlight Type to Row, Background Color to Blue, Text Color to White, Condition Column to Description, Operator to Like, and Expression to Opening Balance%. Click Apply. This rule is created to highlight opening balances of accounts using different colors.

8. Click the Actions menu. Select Format and then Aggregate. Set Aggregation to New Aggregation, Function to Sum, Column to VCHDR (which should be Debit after renaming). Click Apply. This will add a grand total figure for each account after summing up all the values in the debit column.

9. Repeat step 8 for the VCHCR (Credit) column.

10. Click Actions and select Save Report. Select the Save option As Default Report Settings, set Default Report Type to Primary, and click Apply to save these modifications.

11. In the second LOV, select the ABN AMRO bank account that you used in Chapter 14, and hit the Display button to refresh the report, which should now display the two ledgers with the grand totals and individual current balances of these accounts, as shown in Figure 18-1.

18.4 Get Ledger Report in PDF

Since the process of creating the ledger PDF is similar to the vouchers report process that you saw in the previous chapter, I won't repeat it here. However, the distinctions are highlighted in Table 18-3. To assist you further, I've provided the two required files (XML and RTF) along with the corresponding report query and code in the `Chapter18` folder. Note that the `ORDER BY` clause in the report query is different from the interactive report query because the two columns (`COACODE` and `GRP`) defined there created a sorting conflict in Microsoft Word. Ledgers didn't sort data according to voucher dates, resulting in the display of opening balances in between normal transactions rather than on top of each ledger. If you want to try yourself, then create the PDF version by executing the instructions mentioned in the sections starting from "Create Report Query" to "Create Validation" (excluding BI Publisher Desktop installation), considering the attributes in Table 18-3 specific to this segment.

Table 18-3. *Report Query Attributes*

Attribute	Value
Report Query Name	ledger_report
SQL Query	Book_Code\Chapter18\PDF Report Query.txt
XML File Name	ledger_report.xml
Columns in RTF Template Table	coacode, vchdate, vchtype, vchdescription, vchdr, vchcr, and balance
Group by selected in RTF Template	coacode
RTF File Name	ledger_report.rtf
Branch Name	Run Ledger Report
Branch Request	PRINT_REPORT=ledger_report
Validation Name	Check Data
Validation Code	Book_Code\Chapter18\Check Data.txt

18.5 Drill Down to Source Voucher

While scrutinizing a ledger, an accountant may want to see the complete details of a specific transaction appearing in that ledger. To facilitate the accountant, you will provide a link for each transaction in the ledger interactive report to allow easy navigation to the source voucher. Execute the instructions provided in the following sections to add this functionality.

18.5.1 Create Link in Interactive Report

Expand the Columns node in the Ledger interactive report region and set the attributes listed in Table 18-4 for the `VCHDATE` column. This is the column that will act as a link between the ledger and source voucher. The link is created on the date column, and it calls page 44 (created next) to display details of the clicked transaction. It also forwards three values to items on page 44 from the voucher master section.

***Table 18-4.** Link in Interactive Report*

Action	Attribute	Value	
Modify Report Column	Column Name	VCHDATE	
	Type	Link	

	Target	Type = Page In This Application
		Page = 44	

		Set Items	
		Name	**Value**
		P44_VCHDATE	#VCHDATE#
		P44_VCHCODE	#VCHCODE#
		P44_VCHNO	#VCHNO#
		Clear Cache = 44	
	Link Text	#VCHDATE#	

18.5.2 Create Voucher Page

Execute the following steps to create a new page to display the selected voucher when a link is clicked in the ledger report:

1. Create a new page (page 44) from page 43 using the Copy utility as described previously for the Voucher Verification segment. Name the new page **Drilled Down Voucher** and associate it with the Reports menu.
2. Modify the Transaction Details region on page 44 by replacing the existing SQL query with `Book_Code\Chapter18\Drilled Down Voucher.txt`.
3. In the previous section, you passed three page items from the ledger interactive report to this page. However, there is a fourth one (Description) that is displayed in the voucher's master section. Since the master description was not fetched in the interactive report query, you will adopt another technique to fetch a value for this item using the three key values defined on the previous page. On page 44, click the P44_VCHDESCRIPTION item and then set the attributes listed in Table 18-5.

Table 18-5. *P44_VCHDESCRIPTION Attributes*

Attribute	Value
Source Type	SQL Query (return single value)

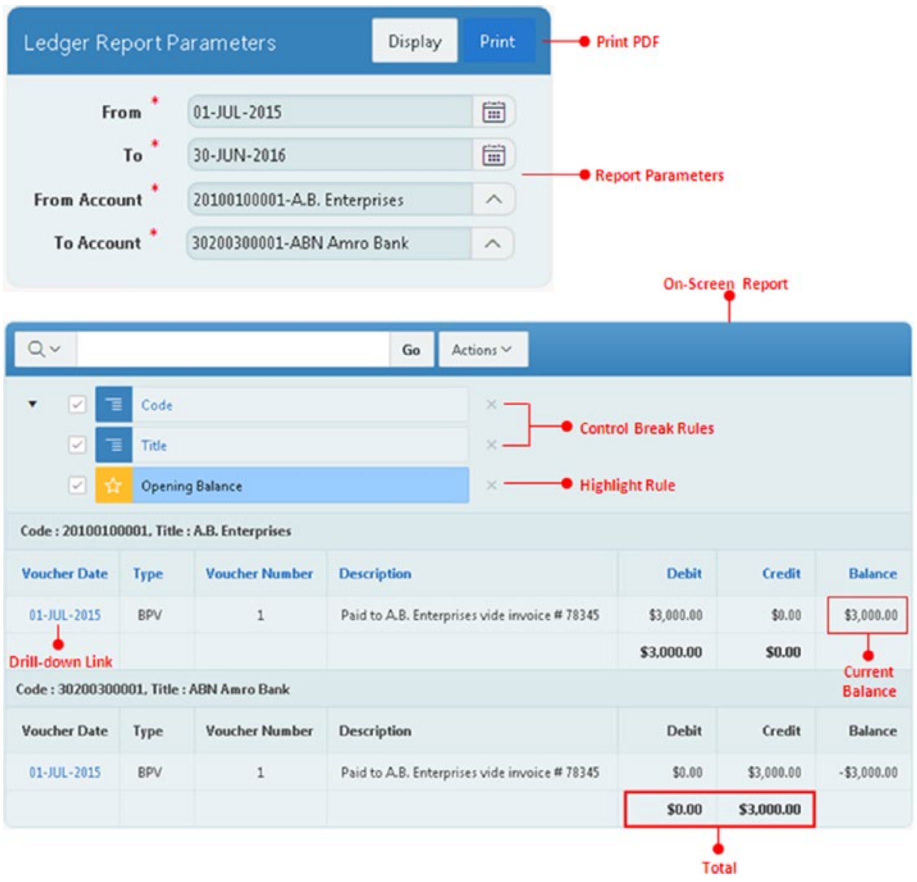
SQL Query	SELECT vchdescription
	FROM gl_tran_master
	WHERE vchdate=:P44_VCHDATE AND
	vchcode=:P44_VCHCODE AND
	vchno=:P44_VCHNO

Source Used	Always, replacing any existing value in session state

4. Click the Cancel button. Set its label to **Back to Ledger** and replace the existing Page attribute value (under Target) from 42 to **72** to move back to the ledger report page.
5. Delete all other buttons, all validations, and all processes.

18.6 Test Your Work

That's it—you're done! The ledger report is ready for a test-drive. Invoke it from the Reports menu and pass different parameters (as illustrated in Figure 18-1) to check both the onscreen and PDF versions. You can optionally add a print button to page 44 that will allow users to print the selected voucher without leaving the interface. You can find its report query in the `Print Drilled Down Voucher.txt` file.



Ledger Report Parameters

From *	01-JUL-2015
To *	30-JUN-2016
From Account *	20100100001-A.B. Enterprises
To Account *	30200300001-ABN Amro Bank

- ✓ Code
- ✓ Title
- ✓ Opening Balance

Code : 20100100001, Title : A.B. Enterprises

Voucher Date	Type	Voucher Number	Description	Debit	Credit	Balance
01-JUL-2015	BPV	1	Paid to A.B. Enterprises vide invoice # 78345	$3,000.00	$0.00	$3,000.00
				$3,000.00	**$0.00**	

Code : 30200300001, Title : ABN Amro Bank

Voucher Date	Type	Voucher Number	Description	Debit	Credit	Balance
01-JUL-2015	BPV	1	Paid to A.B. Enterprises vide invoice # 78345	$0.00	$3,000.00	-$3,000.00
				$0.00	**$3,000.00**	

Figure 18-1. *Ledger report*

18.7 Summary

Using a ledger report you can view the activities and balances of accounts with a few clicks. If you want to see a summarized report of all accounts, move on to the next chapter to create trial balance report.

CHAPTER 19

Trial Balance Report

The trial balance report shows the summarized balances of accounts up to a specific date. It delivers the opening balance, activity, and closing balance of each account. Unlike the ledger report, this report can be produced for any level. For example, you can run a trial balance report for the first level only simply to see top-level account activities. You can also filter the report to display a specific range of financial accounts from the COA along with a cost center should you want to see account balances for only one cost center. The parameters form has just one date picker from where you select the date up to which closing balances are calculated and displayed in the report.

19.1 Trial Balance Report Table

The transaction data, entered through vouchers, are stored in the `gl_tran_master` and `gl_tran_detail` tables. After generating the trial balance report from these two tables, you store the result in the following temporary table. It holds trial balance data for each user until the user runs the report again. The data in this table is populated through a process to be created later in Table 19-4.

TRIAL BALANCE REPORT TABLE

```
CREATE TABLE gl_trial_balance
(coacode VARCHAR2(11), coatitle VARCHAR2(50), coalevel NUMBER(1), opendr
NUMBER(15,2), opencr NUMBER(15,2), activitydr NUMBER(15,2), activitycr
NUMBER(15,2), closingdr NUMBER(15,2), closingcr NUMBER(15,2),
coname VARCHAR2(50), tbdate DATE, fromaccount VARCHAR2(11), toaccount
VARCHAR2(11), cccode VARCHAR2(5),
cctitle VARCHAR2(25), reportlevel NUMBER(1), userid VARCHAR2(50),
grand_total NUMBER(1))
```

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19.2 Create a List of Values

Using Table 19-1, create a LOV from scratch. It will be used to allow you to select any account level for the trial balance report. If you run this report for the transaction level (level 4), all parent levels (that is, 1, 2, and 3) also appear on the report by default, unless you put a check on the parameter option labeled Print Selected Level.

Table 19-1. *LOV Attributes*

Action	Attribute	Value
Create LOV	Name	COA All Levels
	Type	Dynamic
	Query	SELECT coacode||'-'||coatitle d, coacode r FROM gl_coa WHERE cocode=(select cocode from gl_users where userid = :APP_USER) ORDER BY coacode

19.3 Create Page and Parameters Form

Using Table 19-2, create a blank page and its components for this segment.

Table 19-2. *Page and Component Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	73
	Name	Trial Balance Report
	Page Mode	Normal
	Breadcrumb	- don't use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Reports
Create Region	Title	Trial Balance Report Parameters
	Type	Static Content
	Template	Standard

(*continued*)

Table 19-2. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P73_ACCOUNTFROM
	Type	Popup LOV
	Label	<b>From Account</b>
	Region	Trial Balance Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	List of Values	COA All Levels
Create Page Item	Name	P73_ACCOUNTTO
	Type	Popup LOV
	Label	<b>To Account</b>
	Region	Trial Balance Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	List of Values	COA All Levels
Create Page Item	Name	P73_CCCODE
	Type	Popup LOV
	Label	<b>Cost Center</b>
	Region	Trial Balance Report Parameters
	Label Column Span	2
	Template	Optional
	Value Required	No
	LOV Type	Shared Component
	List of Values	Cost Centers

(*continued*)

Table 19-2. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P73_COALEVEL
	Type	Text Field
	Label	<b>Account Level</b>
	Region	Trial Balance Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	Default Type	Static Value
	Static Value	4 *(display report for all levels)*
Create Page Item	Name	P73_TBDATE
	Type	Date Picker
	Label	<b>As On</b>
	Region	Trial Balance Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	Default Type	PL/SQL Expression
	PL/SQL Expression	SYSDATE
Create Button	Button Name	Display
	Label	Display
	Region	Trial Balance Report Parameters
	Button Position	Copy
	Action	Submit Page
Create Button	Button Name	Print
	Label	Print
	Region	Trial Balance Report Parameters
	Button Position	Copy
	Action	Submit Page

19.4 Create the Interactive Report Region

Using Table 19-3, add an interactive report region to the page. It will produce an onscreen version of the trial balance report. It is based on a `SELECT` statement that fetches the report of the current user from the `GL_TRIAL_BALANCE` table. The table is populated using a process defined in the next section.

***Table 19-3.** Interactive Report Region Attributes*

Action	Attribute	Value
Create Region	Title	Trial Balance
	Type	Interactive Report

	SQL Query	SELECT * FROM gl_trial_balance
		WHERE userid = :APP_USER
		ORDER BY coacode

19.5 Create a Process to Generate Trial Balance

The process mentioned in Table 19-4 uses a cursor based on the COA of the logged-in user. The cursor loops through every COA record to calculate account balances. These balances, along with other relevant information, are inserted into the `GL_TRIAL_BALANCE` table with the user ID. After completing the loop, a record is added to the end of the table that shows the grand total for each column. The process is executed when either the Display or Print button is clicked.

***Table 19-4.** Process to Generate Trial Balance*

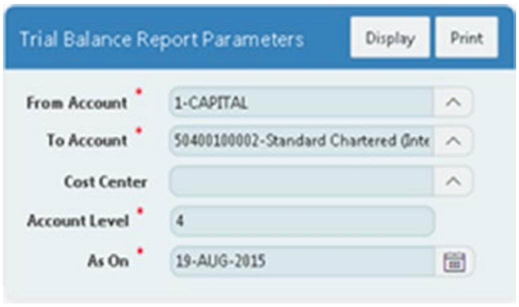
Action	Attribute	Value
Create Process	Name	Generate Trial Balance
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter19\Generate Trial Balance.txt
	Point	Processing
	Condition Type	Request is contained in Value
	Value	Display,Print

19.6 Formatting the Trial Balance Report

Execute the following steps to format the interactive report:

1. Add the appropriate headings to columns as Code, Title, Opening Debit, Opening Credit, Activity Debit, Activity Credit, Closing Debit, and Closing Credit.
2. Modify all the numeric columns to apply the number format mask.

3. Run this module from the Trial Balance option in the Reports menu. Select the values shown in Figure 19-1 in the Parameters region and hit the Display button. At this stage, the report will show the balances of just two accounts along with their group accounts. These are the same accounts you entered in the first voucher.



From Account *	1-CAPITAL
To Account *	50400100002-Standard Chartered (Inte
Cost Center	
Account Level *	4
As On *	19-AUG-2015

Figure 19-1. *Report parameters*

4. Click the Actions menu and then click the Select Columns option. Move the CCCODE, CCTITLE, COALEVEL, CONAME, FROMACCOUNT, REPORTLEVEL, TBDATE, TOACCOUNT, USERID, and GRAND TOTAL columns to the Do Not Display pane, leaving the Code, Title, Opening Debit, Opening Credit, Activity Debit, Activity Credit, Closing Debit, and Closing Credit columns in the Display in Report section. Click Apply.

5. Click the Actions menu again. Select Format ➤ Sort. Select CODE in the first row, keep Direction as Ascending, and keep Null Sorting as Default to sort the report on the Code column. Click Apply.

6. Add a highlight rule (as mentioned in the Formatting Ledger Report section in Chapter 18) for the Grand Total row, using Title and GRAND_TOTAL% as Column and Expression, respectively. Click Apply.

7. Click Actions and select Save Report. Select the option As Default Report Settings, set Default Report Type to Primary, and click Apply to save the report.

19.7 Print the Selected Level

Create a check box item as listed in Table 19-5. When this is selected, the process associated with this check box will remove all records other than the selected level to display a trial balance report for the selected level only. Conversely, keeping it unchecked displays all levels up to the selected level, as you saw in the previous section where you selected 4 as the account level and the result displayed all parent levels. Checking this option would have displayed the report only for the transaction-level accounts.

Table 19-5. *Check Box Attributes*

Action	Attribute	Value
Create Page Item	Name	P73_SELECTEDLEVEL
	Type	Checkbox
	Label	*Clear Label*
	Number of Columns	1
	Region	Trial Balance Report Parameters
	Label Column Span	2
	LOV Type	Static Values
	Static Values	STATIC:Print Selected Level;Y

19.7.1 Create Process

The process listed in Table 19-6 is associated with the previous check box to display/print accounts for the selected level.

Table 19-6. *Process Attributes*

Action	Attribute	Value
Create Process	Name	Print Selected Level
	Type	PL/SQL Code

	PL/SQL Code	DELETE FROM gl_trial_balance
		WHERE coalevel <> :P73_COALEVEL AND
		userid = :APP_USER;

	Point	Processing
	Condition Type	Item = Value
	Item	P73_SELECTEDLEVEL
	Value	Y

19.8 Eliminate Zero Balances

As the name suggests, the process (created later in Table 19-8) associated with the check box created in Table 19-7 will eliminate all records that have no balances at all. This feature will make the report smaller because it removes those records from the trial balance report with zero balances.

Table 19-7. *Checkbox Attributes*

Action	Attribute	Value
Create Page Item	Name	P73_ZEROBALANCE
	Type	Checkbox
	Label	*Clear Label*
	Number of Columns	1
	Region	Trial Balance Report Parameters
	Label Column Span	2
	LOV Type	Static Values
	Static Values	STATIC:Eliminate Zero Balances;Y
	Default Type	Static Value
	Static Value	Y *(all zero balance records will be eliminated by default)*

19.8.1 Create a Process

Create the process shown in Table 19-8. The process will eliminate accounts with zero balance.

Table 19-8. *Process Attributes*

Action	Attribute	Value
Create Process	Name	Eliminate Zero Balances
	Type	PL/SQL Code
	PL/SQL Code	DELETE FROM gl_trial_balance WHERE nvl(opendr,0) = 0 AND nvl(opencr,0) = 0 AND nvl(activitydr,0) = 0 AND nvl(activitycr,0) = 0 AND nvl(closingdr,0) = 0 AND nvl(closingcr,0) = 0 AND userid=:APP_USER;
	Point	Processing
	Condition Type	Item = Value
	Item	P73_ZEROBALANCE
	Value	Y

19.9 Create a Validation

The validation listed in Table 19-9 will check the data for the existence of report criteria.

Table 19-9. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Check Data
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter19\Check Data.txt
	Error Message	No data found
	Condition Type	Request is contained in Value
	Value	Display,Print

19.10 Get the Trial Balance Report in PDF

Create a PDF version of the trial balance report using the instructions in Chapter 17 considering the distinctions listed in Table 19-10.

Table 19-10. *Report Query Attributes*

Attribute	Value
Report Query Name	trial_balance_report

SQL Query	SELECT * FROM gl_trial_balance
	WHERE userid=:APP_USER
	ORDER BY coacode

XML File Name	trial_balance_report.xml
Columns in RTF Template Table	coacode, coatitle, opendr, opencr, activitydr, activitycr, closingdr, and closingcr
Group by selected in RTF Template	*The report doesn't need grouping and sorting*
RTF File Name	trial_balance_report.rtf
Branch Name	Run Trial Balance Report
Branch Request	PRINT_REPORT=trial_balance_report

19.10.1 Template Formatting

The template formatting process for this segment is similar to its predecessors; see the downloaded RTF (in the `Chapter19` folder) for guidance. I added a few more things to this template. For example, I repeated the headers on every report page and used a different color for the Grand Total row and for the six numeric columns. To repeat the report headers in the latest Word versions, select the table in your template (this will show an additional menu named Layout). From the Layout menu, click the first option labeled Repeat Header Rows. To highlight the Grand Total row, click the COATITLE field in the table and select Conditional Format (under the BI Publisher ➤ Insert option). Select GRAND_TOTAL from the Data field list and then set the value to Number in the list next to it. Under the Condition 1 section, set the Data field to Equal to, and enter **1** in the corresponding value box. Click the Format button. Check all the three options (Background Color, Font Color, and Font Style) in the dialog box. Set Font Style to Bold, and pick different background and font colors. The GRAND_TOTAL value that you selected in the first conditional step is a column in the trial balance report table. This column is marked with a 1 for the grand total row; see the PL/SQL code associated with the Generate Trial Balance process (19.5). Repeat the previous step to apply a conditional format rule to all the remaining report columns.

19.11 Drill Down to the Ledger Report

Just like the link that you created in the ledger report to access the source voucher, you will create a link here on the Code column to access the ledger report from within the trial balance. Expand the Trial balance report's Columns node and set the attributes in Table 19-11 for the `COACODE` column. Recall that you needed two account codes and two date parameters to call the ledger report. The values declared in the attributes in Table 19-11 forward account code information to the ledger page. The dates are calculated by the target page itself using a couple of `SELECT` statements.

Table 19-11. *Code Column Link Attributes*

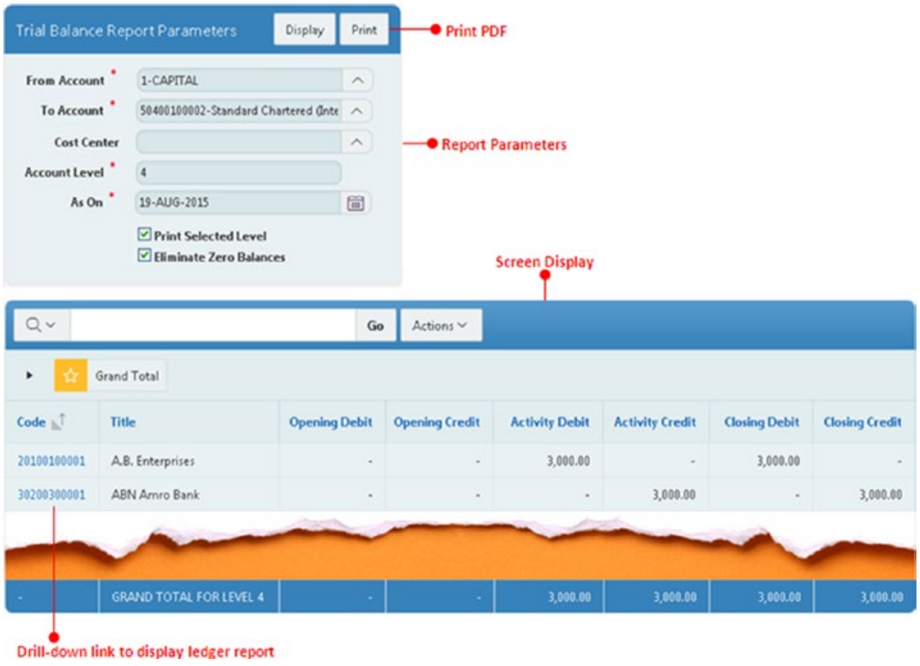
Action	Attribute	Value	
Modify Report Column	Column Name	COACODE	
	Type	Link	

	Target	Type = Page In This Application
		Page = 72	

		Set Items	
		Name	**Value**
		P72_ACCOUNTFROM	#COACODE#
		P72_ACCOUNTTO	#COACODE#
		Clear Cache = 72	
	Link Text	#COACODE#	

19.12 Test Your Work

Run the trial balance report first by passing a complete COA range, as shown in Figure 19-2. Also, try the report by selecting specific accounts and enabling/disabling the optional parameters provided on the page. Note that although the drill-down function applies to all levels (in other words, all account codes appear as links irrespective of levels), the ledger report will display data for the transaction level only.



From Account	1-CAPITAL
To Account	50400100002-Standard Chartered (Inte
Cost Center	
Account Level	4
As On	19-AUG-2015
✓ Print Selected Level	
✓ Eliminate Zero Balances	

Code	Title	Opening Debit	Opening Credit	Activity Debit	Activity Credit	Closing Debit	Closing Credit
20100100001	A.B. Enterprises	-	-	3,000.00	-	3,000.00	-
30200300001	ABN Amro Bank	-	-	-	3,000.00	-	3,000.00
-	GRAND TOTAL FOR LEVEL 4	-	-	3,000.00	3,000.00	3,000.00	3,000.00

Figure 19-2. *Trial balance report*

19.13 Summary

The trial balance report here not only displays summarized balances of accounts, but the online view of this report helps you drill down to an account ledger and then from the ledger account to the source transaction. The next few chapters deal with bank transactions.

CHAPTER 20

Opening Bank Transactions

The application provides you with a complete module to deal with your banking. Recall that while creating accounts in the COA you used a specific type to mark bank accounts; that was the first step in the bank reconciliation process. In addition, the application allows you to reconcile the bank transactions recorded through vouchers with the statements provided by your banks. But, before that, you have to incorporate some bank transactions into this application. These are the transactions recorded either manually or in another system and were not reconciled with the banks. In this chapter, you'll record all such transactions into a separate table that will keep appearing on the Bank Reconciliation page and report unless you mark them as reconciled. The actual reconciliation process will be created in the next chapter.

TABLE TO RECORD OPENING BANK TRANSACTIONS

```
CREATE TABLE gl_banks_os
(sr_no NUMBER, Cocode NUMBER CONSTRAINT fk_banks_os1 REFERENCES GL_Company
(Cocode) NOT NULL,
coacode VARCHAR2(11) NOT NULL, remarks VARCHAR2(50) NOT NULL, vchdr
NUMBER(15,2) NOT NULL,
vchcr NUMBER(15,2) NOT NULL, reconciled NUMBER(1) NOT NULL, CONSTRAINT
pk_banks_os PRIMARY KEY (sr_no), CONSTRAINT fk_banks_os2 FOREIGN KEY
(cocode,coacode) REFERENCES GL_COA)

CREATE SEQUENCE gl_banks_os_seq MINVALUE 1 START WITH 1 INCREMENT BY 1 CACHE 20
```

20.1 Create Page

Using Table 20-1, create a page to record the opening outstanding figures. In this page you'll add a tabular form that allows you to input and save as many outstanding figures as you want.

Table 20-1. *Page Attributes*

Action	Attribute	Value
Create Page	Page Type	Form ➤ Tabular Form
	Table Owner	*Accept the displayed value*
	Table Name	GL_BANKS_OS
	Select Columns	*Select all columns*
	Allowed Operations	Update, Insert and Delete
	Primary Key Type	Select Primary Key Column
	Primary Key Column 1	SR_NO *(stands for Serial Number)*
	Source Type	Existing Sequence
	Sequence	GL_BANKS_OS_SEQ
	Updatable Columns	*Select all columns*
	Page	17
	Page Name	Opening Banks Outstanding
	Page Mode	Normal
	Region Title	Opening Banks Outstanding
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Setup
	Buttons and Branching page	*Accept all the default values*

20.2 Modify Region Source Query

Edit the Opening Banks Outstanding region and modify the Region Source query by adding the `WHERE` clause in Table 20-2. This clause is added to fetch the records of the company to which the user belongs. The clause retrieves only those entries that are still unreconciled.

Table 20-2. *Opening Banks Outstanding Region Attributes*

Action	Attribute	Value

Modify Region	SQL Query	SELECT "SR_NO", "COCODE", "REMARKS", "COACODE",
		"VCHDR", "VCHCR", "RECONCILED"
		FROM "#OWNER#"."GL_BANKS_OS"
		WHERE cocode=(select cocode from gl_users where userid=:APP_USER) AND reconciled=0

Expand the Columns node under the Opening Banks Outstanding region and perform the following modifications:

1. Set the Type attribute of the SR_NO, COCODE, and RECONCILED columns to Hidden Column (saves state) to hide these columns.
2. Types appropriate headings for the four visible columns: **Bank Code**, **Remarks**, **Debit**, and **Credit**.
3. Edit the COACODE column. Set its Type to Popup LOV (shows displays value), set List of Values Type to SQL Query, and enter the following SQL statement in the SQL Query box to display the bank accounts of the current company in the pop-up LOV. Set the Width attribute of this column to **50**.

```
SELECT coacode||'-'||coatitle d, coacode r  FROM
gl_coa
WHERE cocode=(select cocode from gl_users where
userid=:APP_USER) AND coatype='Bank'
ORDER BY coacode
```

4. Modify the VCHDR, VCHCR, and RECONCILED columns and set their Default Type values to PL/SQL Expression and setPL/SQL Expression to **0**. This way the three columns will have zero as the default value.
5. Set the Width attribute of the Remarks column to **50**.
6. Sort records in the tabular form by selecting the `SR_NO` column and setting Default Sequence (under Sorting section) to **1**.

20.3 Handling Default Validations

The APEX engine creates some default validations based on the back-end table constraints. One of these validations is COCODE NOT NULL. If you run the page at this stage and try to save a record, you'll be prevented by this validation because the company code column was hidden in the previous section (step 1) and hence doesn't carry any value. To correct this situation, create a hidden item, as mentioned in Table 20-3.

Table 20-3. *Hidden Item Attributes*

Action	Attribute	Value
Create Page Item	Name	P17_COCODE
	Type	Hidden
	Region	Opening Banks Outstanding
	Source Type	SQL Query (return single value)
	SQL Query	SELECT cocode from gl_users where userid=:APP_USER

Now edit the COCODE column and set the attributes listed in Table 20-4. Using these attributes, the COCODE column inherits its value from the previously hidden item: P17_COCODE. After setting these attributes, the validation won't obstruct you anymore.

Table 20-4. *COCODE Column Attributes*

Action	Attribute	Value
Modify Column	Column Name	COCODE
	Default Type	Item
	Item	P17_COCODE

20.4 Add Validation

The validation listed in Table 20-5 will check whether a positive amount is entered in either the Debit or Credit column.

Table 20-5. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Check Debit/Credit
	Sequence	45 (*place it after COACODE Not NULL validation*)
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter20\Check Debit Credit.txt
	Error Message	Invalid amount
	When Button Pressed	SUBMIT

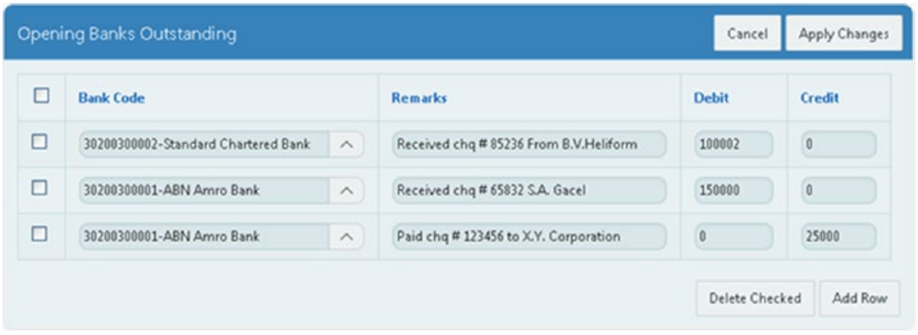
20.5 Test Your Work

Run this segment from the Setup ➤ Opening Bank Transactions menu and execute the following steps:

1. Click the Add Row button to add a blank row where you will enter the first outstanding transaction of a particular bank.
2. From the Bank Code pop-up LOV, which should be displaying only bank accounts, select an account (for example, ABN AMRO). Note that you can enter as many unsettled transactions as you need for a bank using this interface. For example, there are certain deposits not appearing in the bank statement. Similarly, the checks you issued to some creditors were not presented as well. You need to input all such cases on a separate row so that when you run the reconciliation segment, they appear individually as separate entries.

3. Enter something in the remarks column, such as **Opening outstanding as on 30th June 2015.**

4. Enter a numeric value (for example, **10000**) in the Debit column and hit the Apply Changes button to save this entry. Figure 20-1 demonstrates some opening outstanding transactions.


Opening Banks Outstanding

	Bank Code	Remarks	Debit	Credit
☐	30200300002-Standard Chartered Bank	Received chq # 85236 From B.V.Heliform	100002	0
☐	30200300001-ABN Amro Bank	Received chq # 65832 S.A. Gacel	150000	0
☐	30200300001-ABN Amro Bank	Paid chq # 123456 to X.Y. Corporation	0	25000

Figure 20-1. *Opening outstanding transactions*

20.6 Summary

This segment is helpful in the bank reconciliation process. After you record the outstanding transactions through this interface, you are ready to perform the reconciliation activity, as discussed in the next chapter.

CHAPTER 21

Bank Reconciliation

A bank reconciliation is the process by which you match your bank ledger transactions with those in your bank statement and attempt to find any differences between the two. All income transactions appearing on the debit side of your ledger are shown on the credit side of the bank statement. Conversely, all payments that you make are recorded on the credit side of your ledger, and the same transactions are reported on the debit side of the bank statement. This part of the application allows you to identify transactions and perform a reconciliation.

21.1 Create Page and Parameters Form

Using Table 21-1, create a blank page and add components to it. The page contains three regions. The first region (Parameters), which you are already familiar with, carries two radio buttons (Reconciled and Unreconciled) and a Select List showing all accounts marked as the Bank type from the chart of accounts. The reconciled option displays all the records that you reconciled previously with the bank; all unsettled transactions are displayed when you select the Unreconciled option. Whenever you switch banks or select a different criterion from the radio group, the page is submitted to refresh the data.

Table 21-1. *Page Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	51
	Name	Bank Reconciliation
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Utilities

(*continued*)

R. Ahmed, *Cloud Computing Using Oracle Application Express*,
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Table 21-1. (*continued*)

Action	Attribute	Value
Create Region	Title	Bank Reconciliation Parameters
	Type	Static Content
	Template	Standard
Create Page Item	Name	P51_CRITERIA
	Type	Radio Group
	Label	<b>Show</b>
	Number of Columns	2
	Page Action on Selection	Submit Page (*to show data according to the selected option*)
	Region	Bank Reconciliation Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	2
	LOV Type	Static Values
	Static Values	STATIC:Reconciled;1,Unreconciled;0
	Display Null Value	No
	Default Type	Static Value
	Static Value	0
Create Page Item	Name	P51_BANKS
	Type	Select List
	Label	<b>Select a bank</b>
	Page Action on Selection	Submit Page (*to refresh report regions*)
	Region	Bank Reconciliation Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	SELECT coacode||'-'||coatitle d, coacode r FROM gl_coa WHERE cocode=(select cocode from gl_users where userid=:APP_USER) AND coatype='Bank' ORDER BY coacode

21.2 Display Outstanding Opening Transactions

Create the following interactive report region to display all the outstanding bank transactions that you entered in the previous chapter. In the Application Builder interface, click the Create Page button and select the Form option followed by Form on a Table with Report. Use the parameters given in Table 21-2 to complete the wizard. Note that when you provide a page number (on the Report Page screen) of a page that already exists, an interactive report is added to that page. Here, for example, an interactive report region will be added to page 51 along with a corresponding form on a separate page (page 52). All opening outstanding figures will be displayed on page 51 in an interactive report region. Using the edit link in this region, you can call the selected record on page 52 where it is displayed in a form to mark it either as reconciled or as unreconciled. Remember, the `GL_BANKS_OS` table has a flag column named Reconciled, which is attached to the radio items in the form on page 52. Also note that the form allows an update operation only on the Reconciled column.

Table 21-2. *Page Attributes*

Page Type	Attribute	Value
Report Page	Implementation	Interactive
	Page Number	51
	Page Name	Opening Outstanding
	Page Mode	Normal
	Region Title	Opening Outstanding
	Table/View owner	*Accept the displayed value*
	Table/View Name	GL_BANKS_OS
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Utilities
	Report Columns	*Select all columns to include in the report page*
	Optional WHERE Clause	cocode=(select cocode from gl_ users where userid=:APP_USER) AND coacode=:P51_BANKS and reconciled=:P51_CRITERIA
	Edit Link Image	*Select any edit link image from the provided options*

(*continued*)

Table 21-2. (*continued*)

Page Type	Attribute	Value
Form Page	Page Number	52
	Page Mode	Modal Dialog
	Page Name	Reconcile Opening
	Region Title	Reconcile Opening
	Region Template	Standard
	Primary Key Type	Select Primary Key Column(s)
	Primary Key Column 1	SR_NO
	Source for Primary Key Column 1	Existing Sequence
	Sequence	GL_BANKS_OS_SEQ
	Form Columns	*Select all columns to include in the form page*
	Data Manipulation Process	Insert=No, **Update=Yes**, Delete=No

Modify the Opening Outstanding interactive report region on page 51 using the following steps:

1. Set Condition Type to Rows Returned and enter the following query in the SQL Query box. This condition will hide the report region when there is no record for the selected criterion.

```
SELECT 1 FROM "#OWNER#"."GL_BANKS_OS"
WHERE cocode=(select cocode from gl_users where
userid=:APP_USER) AND coacode=:P51_BANKS and
reconciled=:P51_CRITERIA
```

2. Hide the SR_NO, COCODE, COACODE, and RECONCILED columns by setting their Type attribute to Hidden Column. Change the headings for the VCHDR and VCHCR columns to Debit and Credit and set Include Search Bar (under Attributes node) to No to suppress the interactive report's search box.

21.3 Modify Reconcile Opening Form

Edit page 52 (the Reconcile Opening form) and modify the following items. You can access this form from the Opening Outstanding interactive report on page 51 to mark an opening outstanding transaction as reconciled. In the final step of this section, you will transform the P52_RECONCILED item into a radio group with two options. Once you mark an entry as reconciled and submit the change, it disappears from the unreconciled list in the interactive report on page 51. Selecting the Reconciled radio option on page 51 reverses the entry.

1. Mark the P52_COCODE item as hidden.
2. Modify the labels of the page items coacode, vhcdr, and vchcr to Bank Code, Debit, and Credit, respectively.
3. Change the Type attribute of Bank Code, Remarks, Debit, and Credit items to Display Only.
4. Modify the P52_RECONCILED item using the attributes listed in Table 21-3.

Table 21-3. *P52_RECONCILED Attributes*

Attribute	Value
Type	Radio Group
Label	*Clear Label box*
Number of Columns	2
LOV Type	Static Values
Static Values	STATIC:Reconcile;1,Unreconcile;0
Display Null Values	No

21.4 Current Transactions Region

Edit page 51 to add another region. This region will have a tabular form to display and reconcile current transactions entered through vouchers. It is based on a powerful SQL statement that fetches complete transaction information from three relevant tables based on the provided criteria and related to the current company. The statement also ensures that the fetched transactions are neither opening nor closing entries. Closing entries have nothing to do with the reconciliation process. Since you have already made exclusive provision in the previous chapter for individual opening outstanding transactions of banks, opening balances are also exempt from this process. Opening balances are those values that you usually enter through a journal voucher when you switch to a new application from another system. For this application, you will create a voucher carrying the opening balances of accounts in Chapter 24. Note that the transaction table also includes a Reconciled flag column. A value of 1 in this column indicates that the corresponding transaction is reconciled. Create a tabular form region using Table 21-4 to display current bank transactions.

Table 21-4. *Tabular Form Region Attributes*

Action	Attribute	Value
Create Region	Title	Current Transactions
	Type	Tabular Form *(answer OK to the message)*
	SQL Query	SELECT "TD"."LINE_NO", "TM"."VCHDATE", "VCH"."VCHTYPE", "TM"."VCHNO", "TD"."VCHDESCRIPTION", nvl("TD"."VCHREFERENCE",'-') "VCHREFERENCE", "TD"."VCHDR", "TD"."VCHCR", "TD"."RECONCILED" FROM "GL_VOUCHER" "VCH", "GL_TRAN_MASTER" "TM", "GL_TRAN_DETAIL" "TD" WHERE "TM"."COCODE"="TD"."COCODE" AND "TM"."TRAN_NO"="TD"."TRAN_NO" AND "TM"."VCHCODE"="VCH"."VCHCODE" AND "TM"."CLOSING"=0 AND "TM"."VCHDESCRIPTION" <> 'OPENING BALANCES' AND "TM"."COCODE"=(select cocode from gl_users where userid=:APP_USER) AND "TD"."COACODE"=:P51_BANKS AND "TD"."RECONCILED"=:P51_CRITERIA

When you change the type of a region to a tabular form, you get a message "This will just create the tabular form and not the associated processes and validations. To generate the related processes and validations please use the Create Page wizard." You followed the Create Page Wizard approach and created the interactive report on an existing page; see Table 21-1. This time you are using an alternative method to learn something new.

Modify the tabular form by executing the following steps. In step 2, you change the Reconciled column to a check box. Initially you use this check box to reconcile transactions and later uncheck the same check box to reverse the reconciliation process.

1. Expand the Columns node. Click the LINE_NO column and set its Type to Hidden Column (saves state).
2. Click the VCHDATE column and set Default Sequence (in the Sorting section) to 1.
3. For the VCHDR and VCHCR columns, set the heading and column alignments to the right and apply a 5,234.10 format mask.
4. Click the RECONCILED column. Set its Type to Simple Checkbox and enter **1,0** for Checkbox Values. This check box will show all the reconciled entries (in other words, Reconciled=1) with a tiny check mark.
5. Enter meaningful column headings (**Date**, **Type**, **Number**, **Description**, **Reference**, **Debit**, **Credit**, and **Reconcile**).

21.4.1 Create a Button and a Process

The tabular form is created without any DML process, which means that your changes will not be saved to the table. Using Tables 21-5 and 21-6, create a button and a process to allow submission of your reconciliations.

***Table 21-5.** Button Attributes*

Action	Attribute	Value
Create Button	Button Name	SUBMIT
	Label	Save
	Region	Current Transactions
	Button Position	Copy
	Action	Submit Page

Create the process in Table 21-6 on the Processing tab. The tabular form called Multi Row Update is used to update multiple rows from a tabular form region. Here, you are going to update the values in the Reconciled column.

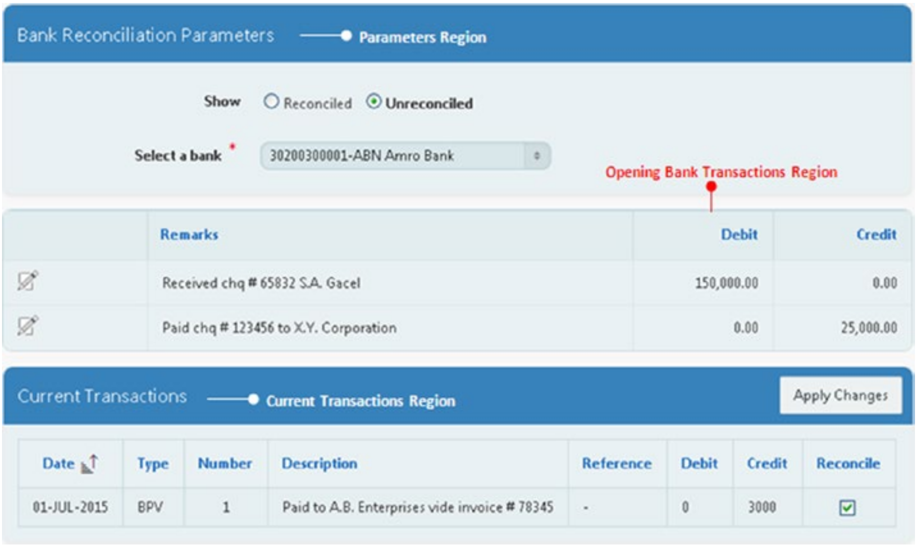
***Table 21-6.** Process Attributes*

Action	Attribute	Value
Create Process	Name	ApplyMRU
	Type	Tabular Form – Multi Row Update
	Table Name	GL_TRAN_DETAIL
	Primary Key Column	LINE_NO
	Point	Processing
	Tabular Form	Current Transactions
	Success Message	Changes saved to the table
	When Button Pressed	SUBMIT

21.5 Test Your Work

Right now you have just two entries to test this segment, one each in the opening outstanding and current transactions. Execute the following steps to perform a reconciliation using the Bank Reconciliation option from the Utilities menu. Figure 21-1 illustrates the three regions you created for this segment in this chapter.

1. Select the Unreconciled option in the parameters region followed by ABN Amro bank from the banks list. The page gets refreshed and shows the two entries in their respective regions.
2. Start the reconciliation by clicking the edit link for the entry appearing in the Opening Outstanding region. This will open page 52 with the selected record. Select the Reconcile option from the radio group and click Apply Changes to mark the opening outstanding entry as reconciled. You are taken back to page 51 where the entry disappears.
3. On page 51, switch the Show option to Reconciled. The entry reappears in its region, but this time it is displayed as a reconciled entry. You can reverse it using the same edit link. Go ahead and test this functionality.
4. To reconcile current transactions, switch the Show option on page 51 back to the Unreconciled, click the check box in the Reconcile column for the sole entry appearing in the Current Transaction region, and click the Save button. Once again the entry will vanish from your screen and can be reinstated by removing the check using the Reconciled option, as you did in the previous step.


Bank Reconciliation Parameters

Show ( ) Reconciled [✓ Unreconciled]

Select a bank * 30200300001-ABN Amro Bank

	Remarks	Debit	Credit
	Received chq # 65832 S.A. Gacel	150,000.00	0.00
	Paid chq # 123456 to X.Y. Corporation	0.00	25,000.00

Current Transactions

Date	Type	Number	Description	Reference	Debit	Credit	Reconcile
01-JUL-2015	BPV	1	Paid to A.B. Enterprises vide invoice # 78345	-	0	3000	✓

Figure 21-1. *Three regions*

21.6 Summary

The bank reconciliation process helps you find discrepancies between your books of accounts and your bank statement. After completing this process, you call the bank reconciliation report (created in the next chapter) that shows balances from both sides along with outstanding transactions (if any).

CHAPTER 22

Bank Reconciliation Report

Even after reconciling your ledger entries with those appearing in the bank statement, there might still be some unsettled transactions on both sides. For example, say a check was issued to a vendor that doesn't appear in the bank statement. Although it was recorded in the application, for some reason it was not presented to the bank in due course. Similarly, say the bank statement reports a credit amount deposited directly by one of your customers that you were not aware of. In the latter case, accountants prepare a receipt voucher to incorporate and reconcile the credit. For the former case, you have to wait until the check appears in a subsequent bank statement. After completing the reconciliation process, the application produces a report that shows the current ledger balance and a calculated bank statement balance, with some unsettled transactions (such as unpresented checks). The two balances should match, if there are no more outstanding figures on either side.

22.1 The Bank Reconciliation Report Table

In a similar way to the trial balance report, the bank reconciliation report is based on a table: `gl_reconcile_report`. Reconciliation reports are also stored for each user individually. The table also stores report parameters for display on the report.

BANK RECONCILIATION REPORT TABLE

```
CREATE TABLE gl_reconcile_report
(srno NUMBER, userid VARCHAR2(50), coname VARCHAR2(50), reportdate DATE,
coacode VARCHAR2(11),
coatitle VARCHAR2(50), monthyear VARCHAR2(14), vchdate DATE, vchtype
VARCHAR2(6), vchno NUMBER(10), vchdescription VARCHAR2(150), vchreference
VARCHAR2(25), amount NUMBER(15,2))
```

R. Ahmed, *Cloud Computing Using Oracle Application Express*,
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22.2 Create the Parameters Form

As usual, create a blank page using Table 22-1 that will carry two regions: Parameters and Interactive Report.

Table 22-1. *Parameters Form Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	74
	Name	Bank Reconciliation Report
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Reports
Create Region	Title	Bank Reconciliation Report Parameters
	Type	Static Content
	Template	Standard
Create Page Item	Name	P74_BANK
	Type	Select List
	Label	<b>Select a bank</b>
	Region	Bank Reconciliation Report Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	Yes
	Type (LOV)	SQL Query
	SQL Query	SELECT coacode||'-'||coatitle d, coacode r FROM gl_coa WHERE cocode=(select cocode from gl_users where userid=:APP_USER) AND coatype='Bank' ORDER BY coacode

(*continued*)

Table 22-1. *(continued)*

Action	Attribute	Value
Create Page Item	Name	P74_REPORTDATE
	Type	Date Picker
	Label	<b>As On</b>
	Region	Bank Reconciliation Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
Create Button	Button Name	Display
	Label	Display
	Region	Bank Reconciliation Report Parameters
	Button Position	Copy
	Action	Submit Page
Create Button	Button Name	Print
	Label	Print
	Region	Bank Reconciliation Report Parameters
	Button Position	Copy
	Action	Submit Page

22.3 Create the Interactive Report

Using Table 22-2, create an interactive report to produce the onscreen version of the reconciliation report. Just like the trial balance report, this one too is based on a `SELECT` statement that fetches the report of the current user from the table `GL_RECONCILE_REPORT`. The table fetches the corresponding data through a process created in the next section.

Table 22-2. *Interactive Report Attributes*

Action	Attribute	Value
Create Region	Title	Bank Reconciliation Report
	Type	Interactive Report

	SQL Query	SELECT * FROM gl_reconcile_report
		WHERE userid=:APP_USER
		ORDER BY srno

22.4 Create the Reconciliation Report Generation Process

Create a process as listed in Table 22-3 to generate the reconciliation report.

Table 22-3. *Process Attributes*

Action	Attribute	Value
Create Process	Name	Generate Reconciliation Report
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter22\Generate Reconciliation Report.txt
	Point	Processing
	Condition Type	Request is contained in Value
	Value	Display,Print

22.5 Format the Reconciliation Report

Execute the following steps to format the interactive report:

1. Hide the SRNO, USERID, CONAME, REPORTDATE, COACODE, and COATITLE columns.
2. Apply a numeric format mask to the Amount column.
3. Modify column headings and give them suitable names, such as **Period**, **Date**, **Type**, **Number**, **Description**, **Reference**, and **Amount**.
4. Run the reconciliation report from the Reports menu and select the values listed in Table 22-4 in the parameters form.

Table 22-4. *Selecting Parameters*

Parameter	Value
Select a bank	ABN Amro
As On	*Select the date you generated the voucher in Chapter 14*

5. Create a highlight rule to highlight ledger and bank balances using the two conditions listed in Table 22-5. The two expressions appearing in this table were added to the report table through the PL/SQL process, defined on the previous page.

Table 22-5. *Highlight Rule*

Rule Name	Column	Operator	Expression
Bank's Balance	Description	=	Balance as per bank statement
Ledger Balance	Description	=	Balance as per Ledger

6. Save the report by selecting As Default Report Settings followed by the Primary option.

22.6 Generate the PDF Report

Follow the instructions mentioned in the preceding chapters to create a PDF version of the report using the attributes in Table 22-6. Here you will add a "Group by" column (`monthyear`) to group the report according to different financial periods. Look at Figure 22-1 where the two outstanding transactions are reported separately in their respective months.

Table 22-6. *Report Query Attributes*

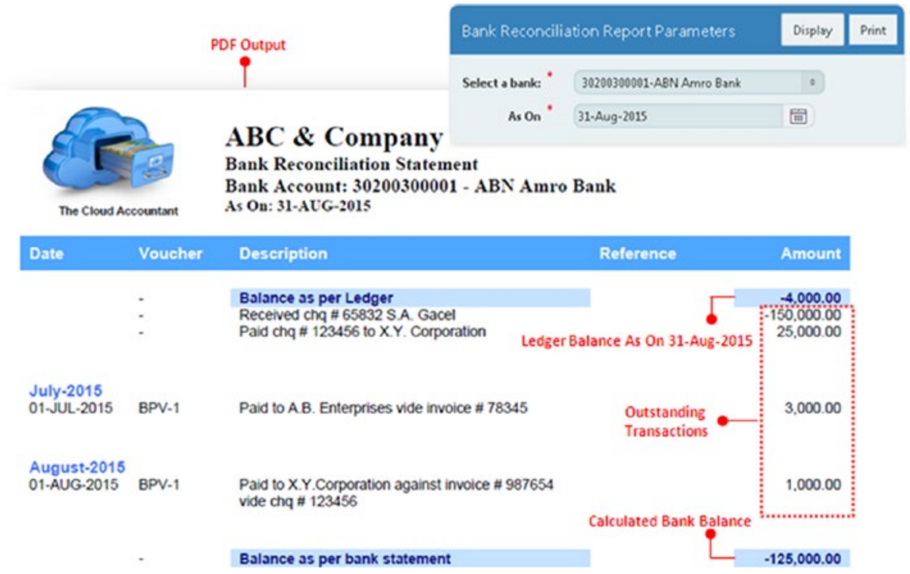
Attribute	Value
Report Query Name	reconciliation_report

SQL Query	SELECT * FROM gl_reconcile_report
	WHERE userid=:APP_USER
	ORDER BY srno

XML File Name	reconciliation_report.xml
Columns in RTF Template Table	monthyear, vchdate, vchtype, vchno, vchdescription, vchreference, and amount
Group by selected in RTF Template	monthyear
Data already sorted	Checked *(already sorted in the above SQL query)*
Break	No Break
RTF File Name	reconciliation_report.rtf
Branch Name	Run Reconciliation Report
Branch Request	PRINT_REPORT=reconciliation_report

22.7 Test Your Work

Run this segment first by keeping the two entries (opening outstanding and current transaction) as unreconciled and watch the output. Then mark both entries as reconciled and rerun the report to observe the impact. In the former test, the two balances (“Balance as per Ledger” and “Balance as per bank statement”) will yield different figures, but when you reconcile both entries, the two should display the same figure. Figure 22-1 shows the parameters form and the report output.



Bank Reconciliation Report Parameters

Select a bank: *	30200300001-ABN Amro Bank
As On *	31-Aug-2015

ABC & Company
Bank Reconciliation Statement
Bank Account: 30200300001 - ABN Amro Bank
As On: 31-AUG-2015

Date	Voucher	Description	Reference	Amount
	-	Balance as per Ledger		-4,000.00
	-	Received chq # 65832 S.A. Gacel		-150,000.00
	-	Paid chq # 123456 to X.Y. Corporation		25,000.00
July-2015				
01-JUL-2015	BPV-1	Paid to A.B. Enterprises vide invoice # 78345		3,000.00
August-2015				
01-AUG-2015	BPV-1	Paid to X.Y.Corporation against invoice # 987654 vide chq # 123456		1,000.00
	-	Balance as per bank statement		-125,000.00

Figure 22-1. *Parameters form and the report output*

22.8 Summary

Bank reconciliation is a monthly activity to keep track of the bank balance and outstanding transactions. The report you created in this chapter reveals both. After completing the interfaces in the previous chapters that deal with the day-to-day accounting tasks, the next couple of chapters deal with the closing process.

CHAPTER 23

Month Closure

It is common practice for organizations to close those fiscal periods for which they are sure to receive no more data. This process is usually referred to as *month closure*. The main purpose of this process is to prevent data manipulation in a closed month. In this chapter, you will create this feature first by creating some procedures to mark a fiscal period as closed and then modifying the main transaction interfaces to apply the desired data security.

23.1 Create Page and Page Items

Using Table 23-1, create a blank page along with its items for this feature. The select list is populated with the 12 fiscal periods of the current company.

Table 23-1. *Page Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	96
	Name	Month Closure
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Closing
Create Region	Title	Month Closure
	Type	Static Content
	Template	Standard

(*continued*)

R. Ahmed, *Cloud Computing Using Oracle Application Express*,
DOI 10.1007/978-1-4842-2502-8_23

Table 23-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P96_COMONTH
	Type	Select List
	Label	<b>Select a month:</b>
	Page Action on Selection	Submit Page
	Region	Month Closure
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	Yes
	Type (LOV)	SQL Query

	SQL Query	`SELECT comonthname d, comonthid r`
		`FROM  gl_fiscal_year`
		`WHERE cocode=(select cocode from`
		`                gl_users where`
		`                upper(userid)=`
		`                upper(:APP_USER))`
		`                AND`
		`      coyear=(select coyear from`
		`              gl_users where`
		`              upper(userid)=`
		`              upper(:APP_USER))`
		`ORDER BY comonthid`

Create Button	Button Name	Close_Month
	Label	Close Month
	Region	Month Closure
	Button Position	Copy
	Action	Submit Page

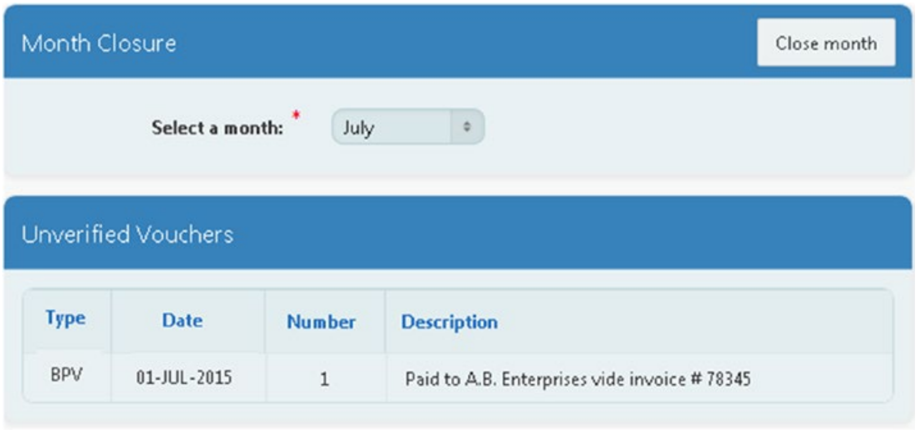
23.2 Show Unverified Vouchers

Using Table 23-2, add an interactive report region to display a list of unverified vouchers. It is being added as a precautionary measure to inform the user about the vouchers that are unverified in the system prior to executing the month closure process. It is good practice to verify all vouchers before closing a month, because vouchers cannot be modified after the month has been closed.

Table 23-2. Interactive Report Region Attributes

Action	Attribute	Value
Create Region	Title	Unverified Vouchers
	Type	Interactive Report
	SQL Query	SELECT VCH.vchtype, TM.vchdate, TM.vchno, TM.vchdescription FROM gl_voucher VCH, gl_tran_master TM WHERE **vchverified='N'** AND VCH.vchcode=TM.vchcode AND cocode=(select cocode from gl_users where upper(userid)=upper(:APP_USER)) AND coyear=(select coyear from gl_users where upper(userid)=upper(:APP_USER)) AND comonthid=:P96_COMONTH

Add meaningful headings to the report's columns, as shown in Figure 23-1. Run the page from the Month Closing option in the main menu. Select the first month (July) from the select list. You'll see the payment voucher you created in Chapter 14, if it is still unverified.



Type	Date	Number	Description
BPV	01-JUL-2015	1	Paid to A.B. Enterprises vide invoice # 78345

Figure 23-1. Unverified payment voucher

23.3 Add Validation

Create the validation listed in Table 23-3 to check whether the selected month is not already closed.

Table 23-3. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Check Month Closure
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter23\Check Month Closure.txt
	Error Message	Month is already closed
	When Button Pressed	Close_Month

23.4 Close Month Process

The process in Table 23-4 will mark the selected month as closed.

Table 23-4. *Process Attributes*

Action	Attribute	Value
Create Process	Name	Close Month
	Type	PL/SQL Code

	PL/SQL Code	UPDATE gl_fiscal_year SET month_closed=1
		WHERE cocode=(select cocode from gl_users where upper(userid) = upper(:APP_USER)) AND
		coyear=(select coyear from gl_users where upper(userid) = upper(:APP_USER)) AND
		comonthid=:P96_COMONTH;

	Point	Processing
	Success Message	Month closed successfully
	Error Message	Could not close the selected month
	When Button Pressed	Close_Month

Rerun the segment and click the Close Month button. You should see the success message. Click the button again. This time you'll get a message: "Cannot proceed with this process because the selected month is already marked as closed." The message confirms that the month has been marked as closed.

23.5 Hide Buttons

After marking a month as closed, no one is allowed to manipulate data in that month. Implement this security by following the instructions in Tables 23-5 to 23-7. The first one will hide the CREATE button on page 42 (if the month is marked as closed) to disallow the creation of new vouchers. Edit page 42 (Vouchers) and add the hidden item in Table 23-5, which stores the closing status of the current month.

Table 23-5. *Item and Button Attributes*

Action	Attribute	Value
Create Page Item	Name	P42_MONTHCLOSED
	Type	Hidden
	Value Protected	Yes (default)
	Sequence	35 *(to place it after P42_COMONTHID)*
	Region	Vouchers
	Source Type	SQL Query (return single value)
	SQL Query	SELECT month_closed FROM gl_fiscal_year WHERE cocode=(select cocode from gl_users where upper(userid)=upper (:APP_USER)) AND coyear=(select coyear from gl_users where upper(userid)=upper (:APP_USER)) AND comonthid=(select comonthid from gl_users where upper(userid)=upper(:APP_USER))
	Source Used	Always, replacing any existing value in session state
Modify Button	Button Name	CREATE
	Condition Type	Item = Value
	Item	P42_MONTHCLOSED
	Value	0 *(the button will be visible only when the value of P42_MONTHCLOSED is zero)*

If you run the Vouchers page now, you won't see the CREATE button, which means that the users cannot create a new voucher in a closed month. In the same way, you also have to hide three more buttons on the Voucher Details page (page 43). These are DELETE, SAVE, and APPLY_CHANGES_MRD. Table 23-6 shows the procedure to prevent amendments on page 43.

Table 23-6. *Preventing Amendments*

Action	Attribute	Value
Create Page Item	Name	P43_MONTHCLOSED
	Type	Hidden
	Value Protected	Yes (default)
	Region	Enter Voucher
	Source Type	SQL Query (return single value)
	SQL Query	*Repeat the query specified for* P42_MONTHCLOSED item
	Source Used	Always, replacing any existing value in session state

Now modify the PL/SQL function defined as a condition for the three buttons, as shown in Table 23-7.

Table 23-7. *PL/SQL Function Modifications*

Action	Attribute	Value
Modify Buttons	Button Name	DELETE, SAVE, and APPLY_CHANGES_MRD

	PL/SQL Function Body (under Condition)	begin
		  if :P43_TRAN_NO IS NOT NULL and
		    :P43_CLOSING=0 and
		    :P43_VCHVERIFIED='N' **and :P43_MONTHCLOSED=0** then
		    return true;
		  else
		    return false;
		  end if;
		end;

23.6 Summary

After executing the month closing process, users cannot add, modify, or delete any voucher in a closed month. This way, the historical data is protected from any kind of manipulation. In the next chapter, you will create two year-end processes to close a fiscal year either temporarily or permanently.

CHAPTER 24

Year-End Processes

The year-end process consists of two options: temporary and permanent. The temporary year-end process performs two actions: first it generates the next fiscal year, and then it transfers the balances of accounts from the closing year to the new fiscal year. When you select this option from the Closing menu, the system asks you to provide a profit and loss account from the chart of accounts, which is used to transfer the difference of revenues and expenses.

The second option is the permanent year-end process, which has two additional tasks: first it checks the closure status of the 12 fiscal periods, and then it marks the year as permanently closed. After the successful completion of this process, you can view the transactions performed in that year and generate reports, but you cannot add, amend, or delete anything.

24.1 Enter Opening Balances

If you are running a business, then you will have some accounts with balances. When you upgrade your general ledger application, these balances act as opening balances in the new application. In this section, you'll incorporate these balances in your application to test the year-end process. It is assumed that you have created a fiscal year (2015) for the ABC & Company, which starts from July 1, 2015, and ends June 30, 2016. From the Select menu, change your working period to June, in other words, the last accounting period. Enter the opening balances of accounts in a JV type voucher using Table 24-1.

Table 24-1. *Opening Balances of Accounts*

Voucher Type: ADJ	Voucher Number: 1	Voucher Date: 30-JUN-2016		
Description: Opening Balances				
Account Code	**Account Title**	**Description**	**Debit**	**Credit**
10100100001	M.H. Thomson	Opening Balance		50,000
10100100002	A.F. Stevens	Opening Balance		50,000
10100300001	Unappropriate Profit/Loss	Opening Balance	20,500	
20100100001	A.B. Enterprises	Opening Balance	10,000	
20100100002	X.Y. Corporation	Opening Balance		40,000
20100200001	Salaries Payable	Opening Balance		8,000
20100200002	Utilities Payable	Opening Balance		4,000
20100300001	ABN Amro Bank (STF)	Opening Balance		12,000
20100400002	Caponi SRL	Opening Balance	6,000	
20100400001	HNH International	Opening Balance		3,000
20100500001	Motor Car (AD)	Opening Balance		4,500
20100500002	Delivery Truck (AD)	Opening Balance		5,000
20200200001	Staff Gratuity Payable	Opening Balance		20,000
30100100001	Office Building	Opening Balance	100,000	
30100100002	Warehouse	Opening Balance	100,000	
30100200002	Computers	Opening Balance	10,000	
30100300001	Motor Car	Opening Balance	30,000	

(*continued*)

Table 24-1. (*continued*)

Account Code	Account Title	Description	Debit	Credit
30200100001	Stock - Raw Material	Opening Balance	1,000	
30200200001	S.A. Gacel	Opening Balance	2,000	
30200200002	B.V.Heliform	Opening Balance		100,000
30200300001	ABN Amro Bank	Opening Balance	150,000	
40100100001	Export Sales	Opening Balance		175,000
50100100001	Stock Consumption - Raw Material	Opening Balance	15,000	
50200100001	Staff Salaries Expense (Admin)	Opening Balance	8,000	
50200100002	Gratuity Expense	Opening Balance	12,000	
50200200001	Electricity Expense	Opening Balance	1,500	
50200300001	Depreciation - Motor Car	Opening Balance	2,000	
50300200001	Depreciation Expense - Delivery Truck	Opening Balance	3,500	
Total			**471,500**	**471,500**

24.2 Temporary Year-End (TYE)

Up until now you have created each application feature in a separate chapter. Though the two year-end segments are listed individually under the Closing menu, you will create both of them in this chapter. Perform the following steps to first create the temporary year-end segment.

24.3 Create the Page and Page Items

The temporary year-end process will receive two values from the user: Voucher Type and Profit and Loss Account. This closing process will first create a new fiscal year. If one already exists, for example, you execute this process for a second time, this step will be skipped. After creating the new fiscal year, the year-end process generates a closing voucher of the selected type to close all revenues and expenses into an account called the Profit and Loss Account. For this purpose, the segment receives the two parameters mentioned earlier. Create a new blank page with page items in Table 24-2.

Table 24-2. *Page Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	93
	Name	Temporary Year-End
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Closing
Create Region	Title	Temporary Year-End
	Type	Static Content
	Template	Standard
Create Page Item	Name	P93_VCHCODE
	Type	Select List
	Label	<b>Select a voucher type:</b>
	Region	Temporary Year-End
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	List of Values	VOUCHER TYPES
Create Page Item	Name	P93_PLACCOUNT
	Type	Popup LOV
	Label	<b>P&L Account:</b>
	Region	Temporary Year-End
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	Shared Component
	List of Values	COA Entry Level

(*continued*)

Table 24-2. (*continued*)

Action	Attribute	Value
Create Button	Button Name	GO
	Label	Execute TYE
	Region	Temporary Year-End
	Button Position	Copy
	Action	Submit Page

24.4 Create a Validation

Add the validation in Table 24-3 to check that the current year is not permanently closed. In such a case the TYE process will not execute.

Table 24-3. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Check Permanent Year Closure
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter24\Check Permanent Year Closure.txt
	Error Message	Year is permanently closed
	When Button Pressed	GO

24.5 Generate the Fiscal Year Process

The process in Table 24-4 creates a new fiscal year when you execute the TYE process for the first time.

Table 24-4. *Process Attributes*

Action	Attribute	Value
Create Process	Name	Generate Fiscal Year
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter24\Generate Fiscal Year.txt
	Point	Processing
	When Button Pressed	GO

24.6 A Process to Generate a Closing Entry

The process in Table 24-5 will close all revenue and expense accounts into a profit and loss account that you will select as the second parameter.

Table 24-5. *Process Attributes*

Action	Attribute	Value
Create Process	Name	Generate Closing Entry
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter24\Generate Closing Entry.txt
	Point	Processing
	Success Message	Temporary year-end process executed successfully
	Error Message	Could not execute the TYE process
	When Button Pressed	GO

■ **Note** The TYE process must be executed to update the profit and loss account whenever you manipulate data in the previous fiscal year.

24.7 Test Your Work

Invoke the page from the Temporary Year End option in the Closing menu, as shown in Figure 24-1. Select a JV type voucher from the first drop-down list. For the second parameter, select the account titled "Unappropriated Profit/Loss account" from the chart of accounts and click the Execute TYE button. You should see a success message after the execution of the process. Now click the Transactions menu and select the voucher type you chose to store the closing entry. You'll see two vouchers in the vouchers report list. The first voucher is the one you entered through Table 24-1 to record opening balances, while the second one (numbered 9999999999) is created by the TYE process to close expense and revenue accounts. Note that this voucher is marked as both verified and posted, which means you cannot modify or delete its contents. Click the edit link next to it and notice that all the data manipulation buttons have disappeared from the details page. The only button you should see is the Cancel button that takes you back to the reports page. Also note that the closing voucher is reflected in the ledger report in the year it was created. For example, if you run a ledger report for an expense or a revenue account, you'll see this voucher. The first task that this process performed was the creation of a new fiscal year. To verify this, click the Select menu and expand the Year select list. Now there will be two years: 2015 and 2016.

24.8 Permanent Year End (PYE)

This is the second year-end process, which prevents any kind of data manipulation operation in a year marked as permanently closed. Execute the following sections to create this process.

24.9 Create the Page and Page Items

Using Table 24-6, create a blank page and items to create the PYE process.

Table 24-6. *Page Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	97
	Name	Permanent Year-End
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Closing
Create Region	Title	Permanent Year-End
	Type	Static Content
	Text	<p>&nbsp&nbsp Before you proceed, make sure that:<br/> &nbsp&nbsp You have closed all 12 fiscal periods.<br/> &nbsp&nbsp You have executed Temporary Year End process recently to register latest closing entries.<br/> <b>&nbsp&nbsp Click Go to proceed!</b></p>
	Template	Standard
Create Button	Button Name	GO
	Label	GO
	Region	Permanent Year-End
	Button Position	Copy
	Action	Submit Page

24.10 Create the Validations

Create the validations in Table 24-7 to fully execute the PYE process. The first validation checks whether the current year is not already marked as permanently closed. For this process to be successful, it is necessary to first close all 12 periods. The second validation ensures that all 12 fiscal periods have been marked as closed. The final validation needs you to execute the TYE process to record the latest closing entries.

Table 24-7. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Permanent Year Closure
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter24\Permanent Year Closure.txt
	Error Message	Year is already permanently closed
	When Button Pressed	GO
Create Validation	Name	Check Months Closure
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter24\Check Months Closure.txt
	Error Message	Fiscal months are not closed
	When Button Pressed	GO
Create Validation	Name	Check Temporary Year End Date
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter24\Check Temporary Year End Date.txt
	Error Message	Execute Temporary Year End process for fresh closing entries
	When Button Pressed	GO

24.11 A Process to Close the Year Permanently

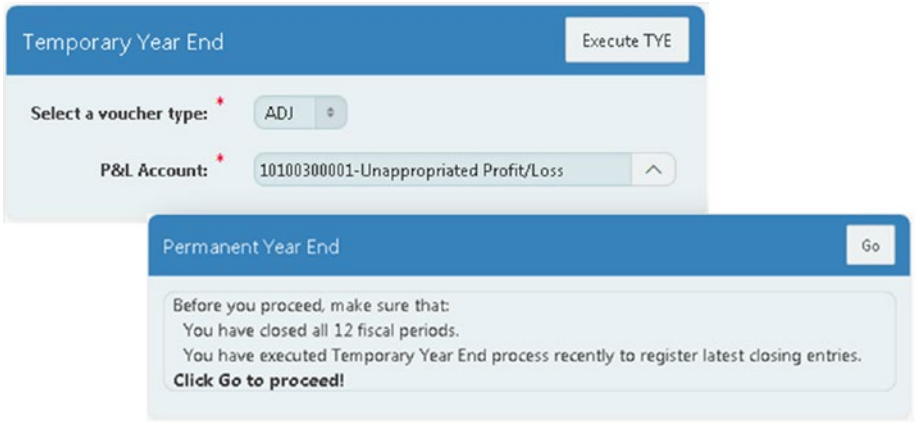
After passing the validations, the currently selected year is marked as permanently closed by the process mentioned in Table 24-8.

Table 24-8. Process Attributes

Action	Attribute	Value
Create Process	Name	Close Year Permanently
	Type	PL/SQL Code
	PL/SQL Code	UPDATE gl_fiscal_year SET year_closed=1 WHERE cocode=(select cocode from gl_users where upper(userid) = upper (:APP_USER)) and coyear=(select coyear from gl_users where upper(userid) = upper (:APP_USER));
	Point	Processing
	Success Message	Permanent year end process executed successfully
	Error Message	Could not execute the PYE process
	When Button Pressed	GO

24.12 Test Your Work

Run the Permanent Year End segment from the Closing menu; you will see the PYE page, as illustrated in Figure 24-1. Hit the Go button. The process will not execute because the 12 fiscal periods are open and must be marked as closed prior to executing this process. Do so by closing all the periods individually from the Month Closing option under the Closing menu and execute this process again. If you ran the TYE process on the same date, the PYE process should execute successfully in this attempt; otherwise, you will get another message to execute the TYE process to register fresh closing entries. After successful execution of this process, transaction manipulation actions are permanently prevented in the current year. Of course, you can view the data through the voucher interface and the reports.



Before you proceed, make sure that:
You have closed all 12 fiscal periods.
You have executed Temporary Year End process recently to register latest closing entries.
Click Go to proceed!

Figure 24-1. Year End Pages

24.13 Summary

After executing the TYE process, you get the next fiscal year. Also, the closing balances of assets, liabilities, and capital accounts are transferred to the next fiscal year. In the next couple of chapters, you will learn how to develop a budget module.

CHAPTER 25

Budget Allocation

A budget is a useful tool to keep spending under control. Every good organization uses this tool to keep an eye on its activities. After allocating a budget to an account, it is compared to the actual expenditure to make sure there is no overspend of money. In the initial year, budgets are allocated manually because of the absence of historical data. In subsequent years, you have two options to define budgets: you can reuse last year's budget or allocate last year's actual spend to act as the current year's budget.

25.1 Budget Allocation Table

Budgets will be saved in the following table for each company, year, and account:

BUDGET ALLOCATION TABLE

```
CREATE TABLE gl_budget
(cocode number constraint fk_budget1 References GL_Company (Cocode)
NOT NULL, coyear number(4), coacode varchar2(11) NOT NULL, coanature
varchar2(11) NOT NULL, cccode varchar2(5), budget_amount1 number(15,2),
budget_amount2 number(15,2), budget_amount3 number(15,2), budget_amount4
number(15,2), budget_amount5 number(15,2), budget_amount6 number(15,2),
budget_amount7 number(15,2), budget_amount8 number(15,2), budget_amount9
number(15,2), budget_amount10 number(15,2), budget_amount11 number(15,2),
budget_amount12 number(15,2), criterion number(1), constraint fk_budget2
Foreign Key (cocode,coacode) References GL_COA);
```

25.2 Create the Page and Parameters Form

Using Table 25-1, create a blank page and add components to it. The two hidden items defined underneath will store the current company's code and year to properly save the budget. Budgets are mainly allocated according to the nature of the account, so you also add a select list to display the five natures from the chart of accounts.

Table 25-1. *Page Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	55
	Name	Budget Allocation
	Page Mode	Normal
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Utilities
Create Region	Title	Budget Allocation Parameters
	Type	Static Content
	Template	Standard
Create Page Item	Name	P55_COCODE
	Type	Hidden
	Source Type	SQL Query (return single value)
	SQL Query	SELECT cocode FROM gl_users WHERE userid = :app_user
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P55_COYEAR
	Type	Hidden
	Source Type	SQL Query (return single value)
	SQL Query	SELECT coyear FROM gl_users WHERE userid = :app_user
	Source Used	Always, replacing any existing value in session state

(*continued*)

Table 25-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P55_COANATURE
	Type	Select List
	Label	<b>Nature of Account:</b>
	Page Action on Selection	Submit Page
	Region	Budget Allocation Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	SELECT DISTINCT coanature d, coanature r FROM gl_coa WHERE cocode=(select cocode from gl_users where userid=:APP_USER)

The three options defined in the Radio Group page item (Table 25-2) help users evaluate which type of budget was saved for the selected nature of account. For example, if a budget was created for a particular nature using the first option (User Defined), then whenever the user selects that nature, the first type is highlighted. After selecting an account nature, you click one of the three provided buttons (User Defined, Last Year Budget, or Last Year Actual in Table 25-2) to specify what type of budget you want to allocate. These buttons are associated with respective processes defined using Table 25-5 later in the chapter.

Table 25-2. *Item and Button Attributes*

Action	Attribute	Value
Create Page Item	Name	P55_CRITERIA
	Type	Radio Group
	Label	<b>Type of Budget:</b>
	Number of Columns	3
	Region	Budget Allocation Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	2
	LOV Type	Static Values
	Static Values	STATIC:1-User Defined;1,2-Last Year Budget;2,3-Last Year Actual;3
	Display Null Value	No
	Source Type	SQL Query (return single value)
	SQL Query	SELECT DISTINCT criterion FROM gl_budget WHERE cocode=:P55_COCODE AND coyear=:P55_COYEAR AND coanature=:P55_COANATURE
	Source Used	Always, replacing any existing value in session state
	Default Type	Static Value
	Static Value	1
Create Button	Name	User_Defined
	Label	User Defined
	Region	Budget Allocation Parameters
	Position	Copy
	Action	Submit Page
Create Button	Name	Last_Year_Budget
	Label	Last Year Budget
	Region	Budget Allocation Parameters
	Position	Copy
	Action	Submit Page

(*continued*)

Table 25-2. *(continued)*

Action	Attribute	Value
Create Button	Name	Last_Year_Actual
	Label	Last Year Actual
	Region	Budget Allocation Parameters
	Position	Copy
	Action	Submit Page

25.3 Create a Tabular Form

After selecting an account nature, you click one of the three buttons created in the previous section. The processes associated with these buttons execute and populate the table `GL_BUDGET` with respective accounts and values. To browse the result and to manipulate the values, you need to create a tabular form. Click the Create Page button in the Application Builder interface to create the tabular form on page 55. Select the Form option followed by Tabular Form in the initial wizard screens. Note that setting page to 55 creates the tabular form on the existing page 55. Use Table 25-3 to complete the tabular form region.

Table 25-3. *Tabular Form Region*

Action	Attribute	Value
Create Region	Table Owner	*Accept the displayed value*
	Table Name	GL_BUDGET
	Select Columns	*Select all columns*
	Allowed Operations	Update, Insert, and Delete
	Primary Key Type	Managed by Database (ROWID)
	Updatable Columns	*All columns*
	Page	55
	Page Name	Budget Allocation
	Page Mode	Normal
	Region Title	Allocate budget for &P55_ COANATURE. accounts
	Buttons and Branching	*Accept all default values*

Modify the new tabular form region to incorporate the following amendments:

1. Add a WHERE clause to the region's SQL query as follows to display the data of the current company, year, and selected nature:

```
SELECT "ROWID","COCODE","COYEAR","COACODE","COANATURE",
       "CCCODE","BUDGET_AMOUNT1",
       "BUDGET_AMOUNT2","BUDGET_AMOUNT3","BUDGET_AMOUNT4",
       "BUDGET_AMOUNT5",
       "BUDGET_AMOUNT6","BUDGET_AMOUNT7","BUDGET_AMOUNT8",
       "BUDGET_AMOUNT9",
       "BUDGET_AMOUNT10","BUDGET_AMOUNT11","BUDGET_
        AMOUNT12","CRITERION"
 FROM   "#OWNER#"."GL_BUDGET"
WHERE cocode=:P55_COCODE and coyear=:P55_COYEAR and
      coanature=:P55_COANATURE
```

2. Modify the attributes listed in Table 25-4 for the COACODE column.

Table 25-4. *COACODE Attributes*

Attribute	Value
Type	Popup LOV (shows displays value)
Heading	Account
LOV Type	Shared Component
List of Values	COA ENTRY LEVEL
Width	35
Default Sequence (under Sorting)	1

3. Set the Type attribute to Hidden Column (saves state) for the COCODE, COYEAR, COANATURE, CCCODE, and CRITERION columns.

4. Modify the COCODE column. Set its Default Type value to **Item** and enter **P55_COCODE** in the Item attribute. Repeat the same for the COYEAR (P55_COYEAR), COANATURE (P55_COANATURE), and CRITERION (P55_CRITERIA) columns. This way, the four table columns will inherit values from the corresponding page items.

5. Set headings for the 12 Budget Amount columns as Month 1, Month 2, and so on, as shown in Figure 25-1 later in this chapter.

25.4 Budget Processes

Using Table 25-5, add three processes to handle the allocation. Each process is associated with a particular button to populate the `GL_BUDGET` table.

Table 25-5. *Process Attributes*

Action	Attribute	Value
Create Process	Name	User Defined Budget
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter25\User Defined Budget.txt
	Point	Processing
	When Button Pressed	User_Defined
Create Process	Name	Last Year Budget
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter25\Last Year Budget.txt
	Point	Processing
	When Button Pressed	Last_Year_Budget
Create Process	Name	Last Year Actual
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter25\Last Year Actual.txt
	Point	Processing
	When Button Pressed	Last_Year_Actual

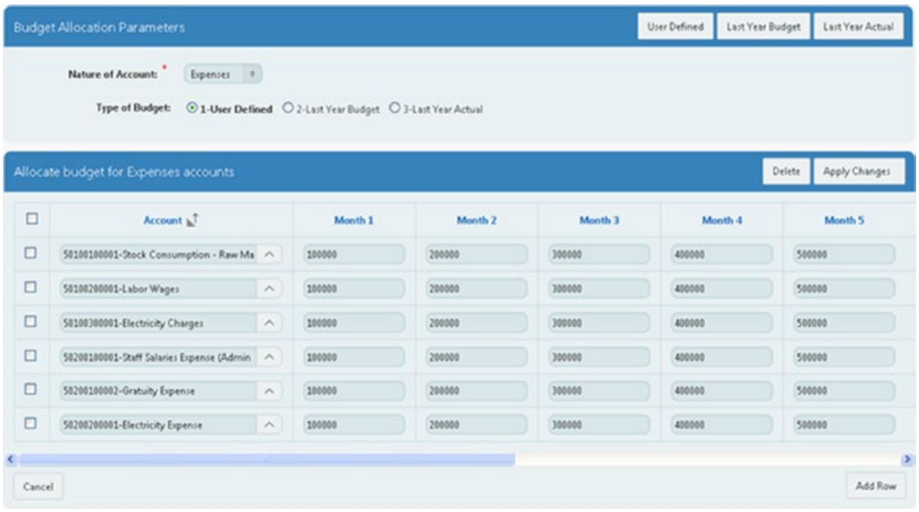
25.5 Test Your Work

Budgets are usually applied to expenses to keep them under control. However, the segment created in this chapter can be used to set a budget for any nature of account. Let's see how a budget is defined.

1. Now that you have two fiscal years (2015 and 2016) for ABC & Company, switch to the new fiscal year (2016) from the select menu. Selecting a period is not necessary for this segment.
2. Invoke the Budget Allocation segment from the Utilities menu.

3. Set Nature of Account to Assets and click the User Defined button. The process associated with this button will populate the tabular form with all asset accounts from the chart of accounts. Note that the first month column (Month 1) represents the first month of the fiscal year. In the current scenario, the first month represents July, the second month represents August, and so on. Enter some numeric figures in some month columns for different accounts and click the Apply Changes button to save the budget values. Switch the nature of account to some other nature and then back to the Assets nature. You'll see the saved figures. Also, note that the type of budget is set to the first option, in other words, User Defined. You save the budget using the Apply Changes button only when you define it manually. For the other two options, you are not required to use this button unless you change the fetched values or add/delete rows from the tabular form.

4. Select Expenses as the nature of account and hit the Last Year Actual button, as shown at the top of Figure 25-1. Scroll to extreme right and note the figures being shown in the Month 12 column, as shown at the bottom of Figure 25-1. These are the figures that you entered as opening balances for respective expense accounts in the month of June in the previous fiscal year.


Budget Allocation Parameters
User Defined
Last Year Budget
Last Year Actual

Nature of Account: * Expenses

Type of Budget: [✓ 1-User Defined] 2-Last Year Budget 3-Last Year Actual

Allocate budget for Expenses accounts
Delete
Apply Changes

☐	Account	Month 1	Month 2	Month 3	Month 4	Month 5
☐	50100100001-Stock Consumption - Raw Ma	100000	200000	300000	400000	500000
☐	50100200001-Labor Wages	100000	200000	300000	400000	500000
☐	50100300001-Electricity Charges	100000	200000	300000	400000	500000
☐	50200100001-Staff Salaries Expense (Admin	100000	200000	300000	400000	500000
☐	50200100002-Gratuity Expense	100000	200000	300000	400000	500000
☐	50200200001-Electricity Expense	100000	200000	300000	400000	500000

Figure 25-1. *Budget allocation page*

25.6 Summary

Since you do not have any previous year budget data, you won't get any result if you click the Last Year Budget button. For this, you will have to create another fiscal year using the temporary year-end process, and then you can use the budget you set in the previous steps. The next chapter provides instructions to generate a budget report.

CHAPTER 26

Budget Report

The budget report displays the variance between the allocated budget figure and the actual figure recorded through vouchers. It also carries a Status column to signify whether the actual value exceeded (over-applied: O) the allocated budget, or it remained within the defined limit (under-applied: U). The parameters form allows you to generate this report for a particular nature, for a single account or a range of accounts, and for different durations.

26.1 Budget Report Table

The following table (already created through the script file) stores budget report values generated by a process defined in Table 26-5 later in the chapter.

BUDGET REPORT TABLE

```
CREATE TABLE gl_budget_report
(coacode VARCHAR2(11), coatitle VARCHAR2(50), budget NUMBER(15,2),
actual NUMBER(15,2), variance NUMBER(15,2), percent NUMBER(7,2),
status VARCHAR2(1), userid VARCHAR2(50), grand_total NUMBER(1), coname
VARCHAR2(50), AccountFrom VARCHAR2(11), AccountTo VARCHAR2(11), MonthFrom
VARCHAR2(9), MonthTo VARCHAR2(9),
PrintedOn timestamp)
```

26.2 Create Page and Parameters Form

As usual, create a blank page (using Table 26-1) that will carry two regions: Parameters and Interactive Report. By selecting an option from the Nature radio group list, you apply a filter to display accounts associated with the selected nature in the two LOVs defined on the next page.

Table 26-1. *Page Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	75
	Name	Budget Report
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Reports
Create Region	Title	Budget Report Parameters
	Type	Static Content
	Template	Standard
Create Page Item	Name	P75_COANATURE
	Type	Radio Group
	Label	<b>Nature:</b>
	Number of Columns	6
	Page Action on Selection	Submit Page
	Region	Budget Report Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	2
	Type (LOV)	Static Values
	Static Values	STATIC:Capital;Capital,Liabilities;Liabilities,Assets;Assets, Expenses;Expenses,Revenue;Revenue
	Display Null Value	No
	Type (Default)	Static Value
	Static Value	Revenue

(*continued*)

Table 26-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P75_ACCOUNTFROM
	Type	Popup LOV
	Label	<b>From:</b>
	Region	Budget Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	SELECT coacode||'-'||coatitle d, coacode r FROM gl_coa WHERE cocode=(select cocode from gl_users where userid=:APP_USER) AND coalevel=4 AND coanature=:P75_COANATURE ORDER BY coacode
Create Page Item	Name	P75_ACCOUNTTO
	Type	Popup LOV
	Label	<b>To:</b>
	Region	Budget Report Parameters
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	*Same as the one defined for P75_ ACCOUNTFROM*

(*continued*)

Table 26-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P75_MONTHFROM
	Type	Select List
	Label	<b>From:</b>
	Region	Budget Report Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	SELECT comonthname d,comonthid r FROM gl_fiscal_year WHERE cocode=(select cocode from gl_users where userid=:APP_USER) AND coyear=(select coyear from gl_users where userid=:APP_USER) ORDER BY comonthid
	Default Type	Static Value
	Static Value	1
Create Page Item	Name	P75_MONTHTO
	Type	Select List
	Label	<b>To:</b>
	Region	Budget Report Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	*Same as the one defined for P75_MONTHFROM*
	Default Type	Static Value
	Static Value	1

(*continued*)

Table 26-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P75_COCODE
	Type	Hidden
	Region	Budget Report Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT cocode FROM gl_users WHERE userid=:APP_USER
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P75_COYEAR
	Type	Hidden
	Region	Budget Report Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT coyear FROM gl_users WHERE userid=:APP_USER
	Source Used	Always, replacing any existing value in session state
Create Button	Button Name	Display
	Label	Display
	Region	Budget Report Parameters
	Button Position	Copy
	Action	Submit Page
Create Button	Button Name	Print
	Label	Print
	Region	Budget Report Parameters
	Button Position	Copy
	Action	Submit Page

26.3 Create Computations

Click the Rendering tab to create two computations (listed in Table 26-2) to display the first and last accounts from the COA in the corresponding page items. Right-click the Before Header node and select Create Computation from the context menu. This will add a Computations node under the Before Header node. Set the following attributes as shown in Table 26-2.

Table 26-2. *Computation Attributes*

Action	Attribute	Value
Create Computation	Item Name	P75_ACCOUNTFROM
	Point	Before Header
	Computation Type	SQL Query (return single value)
	SQL Query	SELECT **MIN(coacode)** FROM gl_coa WHERE coanature=:P75_COANATURE AND coalevel=4 AND cocode=:P75_COCODE
Create Computation	Item Name	P75_ACCOUNTTO
	Point	Before Header
	Computation Type	SQL Query (return single value)
	SQL Query	SELECT **MAX(coacode)** FROM gl_coa WHERE coanature=:P75_COANATURE AND coalevel=4 AND cocode=:P75_COCODE

26.4 Create Interactive Report

Using Table 26-3, create an interactive report to create the onscreen version of the budget report.

Table 26-3. *Interactive Report Attributes*

Action	Attribute	Value
Create Region	Title	Budget Report
	Type	Interactive Report
	SQL Query	SELECT * FROM gl_budget_report WHERE userid=:APP_USER ORDER BY grand_total,coacode
	Template	Standard

Modify the interactive report to incorporate the following amendments:

1. Set meaningful column headings.

2. Run the page, and using the Actions menu ➤ Select Columns option, move Account Code, Title, Budgeted Amount, Actual Amount, Variance, Percent, and Status columns to the Display in Report pane.
3. Create a highlight rule as listed in Table 26-4 to highlight the grand total row using different text and background colors.

Table 26-4. *Highlight Rule*

Rule Name	Column	Operator	Expression
Grand Total	Grand Total	=	1

4. Save the report by selecting As Default Report Settings, followed by the Primary option.

26.5 Budget Report Generation Process

The process mentioned in Table 26-5 generates the budget report and stores the result in the `gl_budget_report` table with respective user ID and parameters.

Table 26-5. *Budget Report Generation Process*

Action	Attribute	Value
Create Process	Name	Generate Budget Report
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter26\Generate Budget Report.txt
	Point	Processing
	Condition Type	Request is contained in value
	Value	Display,Print

26.6 Generate PDF Report

Create a PDF version of this report using the attributes and values listed in Table 26-6.

Table 26-6. *Report Query Attributes*

Attribute	Value
Report Query Name	budget_report

SQL Query	SELECT * FROM gl_budget_report
	WHERE userid=:APP_USER
	ORDER BY grand_total,coacode

XML File Name	budget_report.xml
Columns in RTF Template Table	Account Code, Title, Budget Amount, Actual Amount, Variance, Percent, and Status
RTF File Name	budget_report.rtf
Branch Name	Run Budget Report
Branch Request	PRINT_REPORT=budget_report

26.7 Test Your Work

Execute the following steps to test this segment. Make sure your current company is ABC & Company and your working period is July in 2016. In other words, the text *ABC & Company July, 2016* should display on your screen.

1. Using Tables 26-7 and 26-8, create two sales vouchers. Note that I created a separate voucher type (SI) to record sales transactions.

Table 26-7. *Sales Voucher 1*

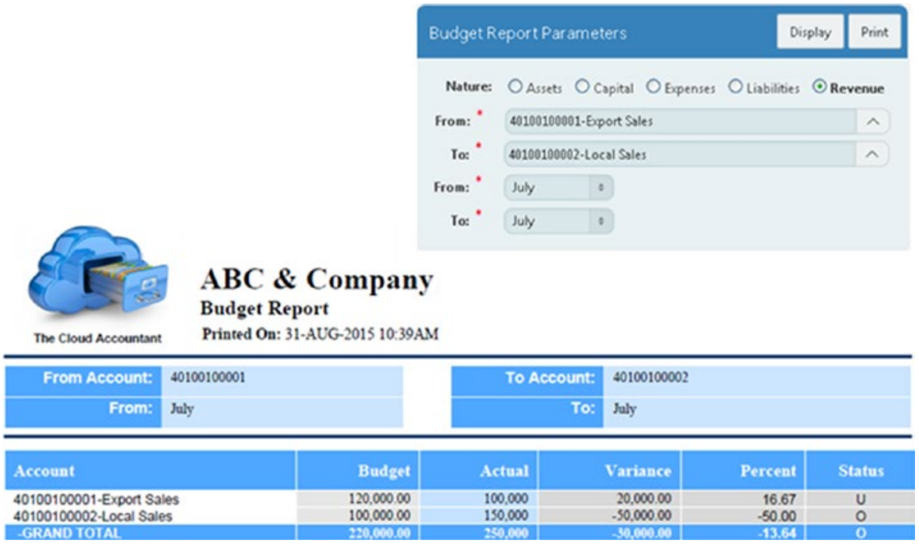
Voucher Type: SI		**Voucher Number: 1**	**Voucher Date: 01-JUL-2016**	
Description: Recorded export sales vide invoice # 123456				
Account Code	**Account Title**	**Description**	**Debit**	**Credit**
30200200001	S.A. Gacel	Recorded export sales vide invoice # 123456	100,000	-
40100100001	Export Sales	Recorded export sales vide invoice # 123456	-	100,000
Total			**100,000**	**100,000**

Table 26-8. *Sales Voucher 2*

Voucher Type: SI		Voucher Number: 2	Voucher Date: 15-JUL-2016	
Description: Recorded local sales vide invoice # 987654				
Account Code	**Account Title**	**Description**	**Debit**	**Credit**
30200200002	B.V. Heliform	Recorded local sales vide invoice # 987654	150,000	-
40100100002	Local Sales	Recorded local sales vide invoice # 987654	-	150,000
Total			**150,000**	**150,000**

2. From the Utilities menu, click the Budget Allocation option. Select Revenue as the nature of account and click the User Defined button. You'll get the four accounts marked as Revenue in the tabular form. Enter **120000** and **100000** in the Month 1 column for Export Sales and Local Sales, respectively. This will set a budget for these two accounts for the month of July. Click the Apply Changes button.

3. Invoke the Budget Report segment from the Reports menu. Fill in the parameters as shown in Figure 26-1 (top) and hit the Display button. You will see the report shown in Figure 26-1 (bottom).



Nature: ○ Assets ○ Capital ○ Expenses ○ Liabilities [✓ Revenue]
From: 40100100001-Export Sales
To: 40100100002-Local Sales
From: July
To: July

ABC & Company
Budget Report
Printed On: 31-AUG-2015 10:39AM

From Account:	40100100001	To Account:	40100100002
From:	July	To:	July

Account	Budget	Actual	Variance	Percent	Status
40100100001-Export Sales	120,000.00	100,000	20,000.00	16.67	U
40100100002-Local Sales	100,000.00	150,000	-50,000.00	-50.00	O
-GRAND TOTAL	220,000.00	250,000	-30,000.00	-13.64	O

Figure 26-1. *Budget report*

26.8 Summary

By showcasing the difference between the budgeted and actual values, the budget report helps management keep things under control. In addition to this report, there are few more financial reports (discussed in the next chapter) that inform management about the health of their organizations.

CHAPTER 27

Set Up Accounts for Financial Statements

Organizations prepare financial statements periodically (especially at the end of a fiscal year) to assess business performance. The two most common financial statements are the profit and loss (P&L) statement and the balance sheet. In this chapter, you will create a setup where users will provide parameters in the form of account codes from the chart of accounts for these two reports. These accounts will be used in the next chapter to produce the two financial statements.

27.1 Accounts Table for the Financial Statements

The following table was created through the script file to store financial statement accounts:

FINANCIAL STATEMENTS ACCOUNTS TABLE

```
CREATE TABLE gl_fs_setup
(cocode NUMBER, reportcode varchar2(4), reporttitle varchar2(50), fsaccount
varchar2(50), AccountFrom varchar2(11), AccountTo varchar2(11), CONSTRAINT
GL_FS_SETUP_PK PRIMARY KEY (cocode,reportcode,fsaccount) ENABLE)
```

27.2 Create a List of Values

Using Table 27-1, create a static list of values from scratch and name it Financial Statement Accounts.

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Table 27-1. *Financial Statement Accounts LOV*

Display Value	Return Value	
Sales	Sales	Profit & Loss Parameters
Cost of Goods	Cost of Goods	
Administrative Expenses	Admin	
Selling & Marketing Expenses	Selling	
Financial Charges	Financial	
Share Capital	Share Capital	Balance Sheet Parameters
Reserves	Reserves	
Profit/(Loss)	Profit/(Loss)	
Trade Creditors	Trade Creditors	
Accrued Expenses	Accrued Expenses	
Short Term Finance	Short Term Finance	
Advance From Customers	Advance From Customers	
Accumulated Depreciation	Accumulated Depreciation	
Banks Overdrafts	Banks Overdrafts	
Long Term Liabilities	Long Term Liabilities	
Building	Building	
Office Equipment	Office Equipment	
Vehicles	Vehicles	
Stock in Trade	Stock in Trade	
Trade Debts	Trade Debts	
Cash and Bank	Cash and Bank	

■ **Note** Initially the LOV wizard allows 15 entries. To add more entries, modify the LOV and use the Create Entry button.

27.3 Create Page and Page Items

Create a blank page and add the items to it using Table 27-2.

Table 27-2. *Page Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	18
	Name	Financial Statements Setup
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Setup
Create Region	Title	Financial Statements Parameters
	Type	Static Content
	Template	Standard
Create Page Item	Name	P18_COCODE
	Type	Hidden
	Region	Financial Statements Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT cocode FROM gl_users WHERE userid=:APP_USER
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P18_EXISTINGNEW
	Type	Radio Group
	Label	<b>Report:</b>
	Number of Columns	2
	Page Action on Selection	Submit Page
	Region	Financial Statements Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	2
	Template	Required
	LOV Type	Static Values
	Static Values	STATIC:New;NEW,Existing;EXISTING
	Display Null Value	No
	Type (Default)	Static Value
	Static Value	EXISTING

(*continued*)

Table 27-2. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P18_REPORTCODE1
	Type	Select List
	Label	<b>Code:</b>
	Page Action on Selection	Submit Page
	Region	Financial Statements Parameters
	Start New Row	No
	Column	Automatic
	New Column	Yes
	Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	No
	LOV Type	SQL Query
	SQL Query	SELECT DISTINCT reportcode d, reportcode r FROM gl_fs_setup WHERE cocode=:P18_COCODE
	Type (Condition)	Item = Value
	Item	P18_EXISTINGNEW
	Value	EXISTING
Create Page Item	Name	P18_REPORTTITLE1
	Type	Text Field
	Label	<b>Title:</b>
	Region	Financial Statements Parameters
	Start New Row	No
	Column	Automatic
	New Column	Yes
	Column Span	Automatic
	Label Column Span	2
	Width	50
	Source Type	SQL Query (return single value)
	SQL Query	SELECT reporttitle FROM gl_fs_setup WHERE reportcode=:P18_REPORTCODE1 and cocode=:P18_COCODE
	Source Used	Always, replacing any existing value in session state
	Type (Condition)	Item = Value
	Item	P18_EXISTINGNEW
	Value	EXISTING

(*continued*)

Table 27-2. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P18_REPORTCODE2
	Type	Text Field
	Label	<b>Code:</b>
	Region	Financial Statements Parameters
	Start New Row	No
	Column	Automatic
	New Column	Yes
	Column Span	Automatic
	Label Column Span	2
	Type (Condition)	Item = Value
	Item	P18_EXISTINGNEW
	Value	NEW
Create Page Item	Name	P18_REPORTTITLE2
	Type	Text Field
	Label	<b>Title:</b>
	Region	Financial Statements Parameters
	Start New Row	No
	Column	Automatic
	New Column	Yes
	Column Span	Automatic
	Label Column Span	2
	Width	50
	Type (Condition)	Item = Value
	Item	P18_EXISTINGNEW
	Value	NEW

27.4 Create a Tabular Form

Click the Create Page button in the Application Builder interface to create a tabular form region on page 18 using Table 27-3. Select the Form option followed by the Tabular Form option in the initial wizard screens. In this tabular form, you will specify accounts for each report.

Table 27-3. *Tabular Form Attributes*

Action	Attribute	Value
Create Region	Table Owner	*Accept the displayed value*
	Table Name	GL_FS_SETUP
	Select Columns	*Select all columns*
	Allowed Operations	Update, Insert, and Delete
	Primary Key Type	Managed by Database (ROWID)
	Updatable Columns	*All columns*
	Page	18
	Page Name	Financial Statements Setup
	Page Mode	Normal
	Region Title	Accounts for &P18_REPORTTITLE1.
	Buttons and Branching	*Accept all default values*

Modify the new tabular form region on page 18 to incorporate the following amendments:

1. Add a WHERE clause to the region's SQL query as follows to display the data of the current company, year, and selected nature:

```
SELECT "ROWID", "COCODE", "REPORTCODE", "REPORTTITLE",
"FSACCOUNT", "ACCOUNTFROM",
              "ACCOUNTTO"
FROM   "#OWNER#"."GL_FS_SETUP"
WHERE (reportcode=:P18_REPORTCODE1 or reportcode=:P18_
REPORTCODE2) and
               cocode=:P18_COCODE
ORDER BY ACCOUNTFROM
```

2. Modify the COCODE column. Set Default Type to Item and enter **P18_COCODE** in the Item attribute.

3. Hide the columns `COCODE`, `REPORTCODE`, and `REPORTTITLE` by setting the Type property to Hidden Column (saves state).

4. Modify the attributes listed in Table 27-4 for the `FSACCOUNT` column.

Table 27-4. *FSACCOUNT Column Attributes*

Attribute	Value
Type	Select List
Heading	Account
LOV Type	Shared Component
List of Values	FINANCIAL STATEMENT ACCOUNTS

5. Modify the attributes listed in Table 27-5 for the `ACCOUNTFROM` and `ACCOUNTTO` columns.

Table 27-5. *ACCOUNTFROM and ACCOUNTTO Column Attributes*

Attribute	Value
Type	Popup LOV (shows displays value)
Heading	From/To
LOV Type	Shared Component
List of Values	COA ALL LEVELS
Width	45

6. Click the Attributes node representing the tabular form and set the Number of Rows attribute to **20**.

27.5 Create Validations

Using Table 27-6, create two validations. The first one checks for a report code when you create parameters for a new report. The second one prompts you if it finds a code that already exists in the database.

Table 27-6. *Validation Attributes*

Action	Attribute	Value
Create Validation	Name	Report Code Not NULL
	Type	Item is NOT NULL
	Item	P18_REPORTCODE2
	Error Message	Report Code must be provided for new reports
	When Button Pressed	SUBMIT
	Condition Type	Item = Value
	Item	P18_EXISTINGNEW
	Value	NEW
Create Validation	Name	Check Report Code
	Type	PL/SQL Function (returning Error Text)
	PL/SQL Function	Book_Code\Chapter27\Check Report Code.txt
	Error Message	Report Code already exists
	When Button Pressed	SUBMIT

27.6 Create Process

The process mentioned in Table 27-7 will populate the report code and the title in the tabular form to associate the code with the selected accounts.

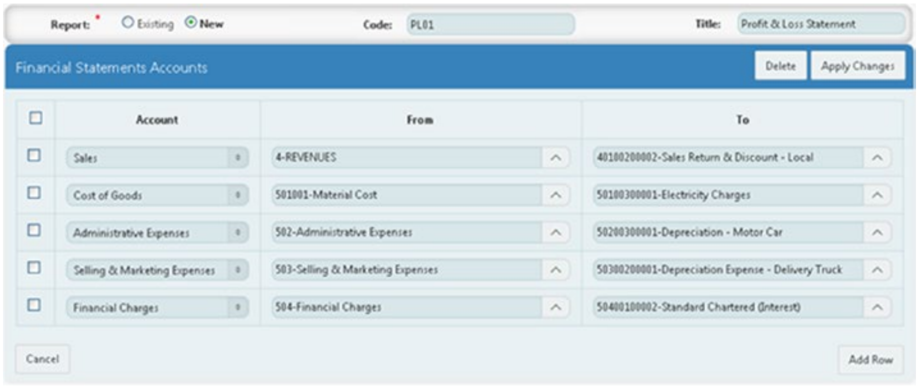
Table 27-7. *Process Attributes*

Action	Attribute	Value
Create Process	Name	Populate Report Code Value in TF
	Type	PL/SQL Code
	PL/SQL Code	Book_Code\Chapter26\Populate Report Code Value in TF.txt
	Sequence	**5** *(to be placed before ApplyMRU process)*
	Point	After Submit *(to execute it before* REPORTCODE not null *validation)*
	When Button Pressed	SUMBIT

27.7 Test Your Work

Execute the following steps to test this segment:

1. Run the segment from the Financial Statement option under the Setup menu. You'll see the segment page as illustrated in Figure 27-1.
2. Select the New option from the radio group to define parameters for a new report.
3. In the Code box, enter **PL01** and type **Profit & Loss Statement** in the Title box.
4. Click the Add Row button to define the first account for this report.
5. In the Account column, select Sales from the select list. Click From LOV and select the 4-REVENUES account from the chart of accounts. Click the To LOV and select the last-selling account (in other words, 40100200002 Sales Return & Discount – Local). By setting these parameters, you specified a range for the sales accounts that will be used in the next chapter to fetch sales figures for the P&L report.
6. Add some more P&L accounts to the tabular form, as shown in Figure 27-1, to complete this setup.
7. Click the Apply Changes button.
8. Using a file named `Balance Sheet Accounts.PNG` in the book's code, create a new report to specify accounts for the balance sheet.



Report: * ○ Existing [✓ New]   Code: PL01   Title: Profit & Loss Statement

☐	Account	From	To
☐	Sales	4-REVENUES	40100200002-Sales Return & Discount - Local
☐	Cost of Goods	501001-Material Cost	50100300001-Electricity Charges
☐	Administrative Expenses	502-Administrative Expenses	50200300001-Depreciation - Motor Car
☐	Selling & Marketing Expenses	503-Selling & Marketing Expenses	50300200001-Depreciation Expense - Delivery Truck
☐	Financial Charges	504-Financial Charges	50400100002-Standard Chartered (Interest)

Figure 27-1. *P&L accounts*

27.8 Summary

In this chapter, you laid the foundation for the two most significant financial reports: the P&L statement and the balance sheet. In the next chapter, you will learn how to create these two reports.

CHAPTER 28

Financial Statements

This is the segment that returns the final result of the efforts you have made so far. In this chapter, you will create the profit and loss (P&L) and balance sheet financial statements. These statements are based on the setup parameters you specified in the previous chapter. The P&L statement shows the profitability, whereas the balance sheet reports on the equities, liabilities, and assets of a business. Combined, these two reports reveal the financial state of an organization.

28.1 Financial Statements Table

The following table was added to the database through the script file to store the two financial statements along with respective notes:

FINANCIAL STATEMENTS TABLE

```
CREATE TABLE gl_fs_report
(reportcode varchar2(4), reporttitle varchar2(50), srno NUMBER, fsaccount
varchar2(50), currentbalance number(15,2), previousbalance number(15,2),
percent number(7,2), userid varchar2(50), coname varchar2(50), coyear
number(4), comonthname varchar2(9), calculation number(1), netvalue
number(1), notes number(1), notescode varchar2(11), notestitle varchar2(50),
heading number(1))
```

28.2 Create Page and Page Items

Create a blank page and add the items to it using Table 28-1.

Table 28-1. *Page Attributes*

Action	Attribute	Value
Create Blank Page	Page Number	76
	Name	Financial Statements
	Page Mode	Normal
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Reports
Create Region	Title	Financial Statements Parameters
	Type	Static Content
	Template	Standard
Create Page Item	Name	P76_COCODE
	Type	Hidden
	Region	Financial Statements Parameters
	Source Type	SQL Query (return single value)

	SQL Query	SELECT cocode FROM gl_users
		WHERE userid=:APP_USER

Create Page Item	Name	P76_CONAME
	Type	Hidden
	Region	Financial Statements Parameters
	Source Type	SQL Query (return single value)

	SQL Query	SELECT coname FROM gl_company
		WHERE cocode=(select cocode from
		gl_users
		where upper(userid)=
		upper(:APP_USER))

Create Page Item	Name	P76_CURRENTFROMDATE
	Type	Hidden
	Region	Financial Statements Parameters
	Source Type	SQL Query (return single value)

	SQL Query	SELECT pfrom FROM gl_fiscal_year
		WHERE cocode=:P76_COCODE and
		coyear=:P76_CURRENTYEAR
		and comonthid=1

	Source Used	Always, replacing any existing value in session state

(*continued*)

Table 28-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P76_CURRENTTODATE
	Type	Hidden
	Region	Financial Statements Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT pto FROM gl_fiscal_year WHERE cocode=:P76_COCODE AND coyear=:P76_CURRENTYEAR AND comonthid=:P76_ CURRENTMONTH
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P76_PREVIOUSFROMDATE
	Type	Hidden
	Region	Financial Statements Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT pfrom FROM gl_fiscal_year WHERE cocode=:P76_COCODE AND coyear=:P76_CURRENTYEAR-1 AND comonthid=1
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P76_PREVIOUSTODATE
	Type	Hidden
	Region	Financial Statements Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT pto FROM gl_fiscal_year WHERE cocode=:P76_COCODE AND coyear=:P76_CURRENTYEAR-1 AND comonthid=:P76_ CURRENTMONTH
	Source Used	Always, replacing any existing value in session state

(*continued*)

Table 28-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P76_COMONTHNAME
	Type	Hidden
	Region	Financial Statements Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT comonthname FROM gl_fiscal_year WHERE cocode=:P76_COCODE AND coyear=:P76_CURRENTYEAR AND comonthid=:P76_CURRENTMONTH
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P76_REPORTCODE
	Type	Select List
	Label	<b>Code:</b>
	Region	Financial Statements Parameters
	Start New Row	Yes
	Column/Column Span	Automatic
	Label Column Span	1
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	SELECT distinct reportcode||' - '||reporttitle d, reportcode r FROM gl_fs_setup WHERE cocode=:P76_COCODE
Create Page Item	Name	P76_CURRENTYEAR
	Type	Select List
	Label	<b>Current Year:</b>
	Region	Financial Statements Parameters
	Start New Row	No
	Column	Automatic
	New Column	Yes
	Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query
	SQL Query	SELECT distinct coyear d, coyear r FROM gl_fiscal_year WHERE cocode=:P76_COCODE ORDER BY coyear

(*continued*)

Table 28-1. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P76_CURRENTMONTH
	Type	Select List
	Label	<b>Month:</b>
	Region	Financial Statements Parameters
	Start New Row	No
	Column	Automatic
	New Column	Yes
	Column Span	Automatic
	Label Column Span	2
	Template	Required
	Value Required	Yes
	LOV Type	SQL Query

	SQL Query	SELECT DISTINCT comonthname d, comonthid r
		FROM gl_fiscal_year
		WHERE cocode=:P76_COCODE order by comonthid

Create Button	Button Name	PROFIT_LOSS
	Label	Generate P&L
	Region	Financial Statements Parameters
	Button Position	Copy
	Action	Submit Page
Create Button	Button Name	BALANCE_SHEET
	Label	Generate Balance sheet
	Region	Financial Statements Parameters
	Button Position	Copy
	Action	Submit Page

28.3 Create Interactive Report and Buttons

Using Table 28-2, create an interactive report region to produce the onscreen view of the financial statements.

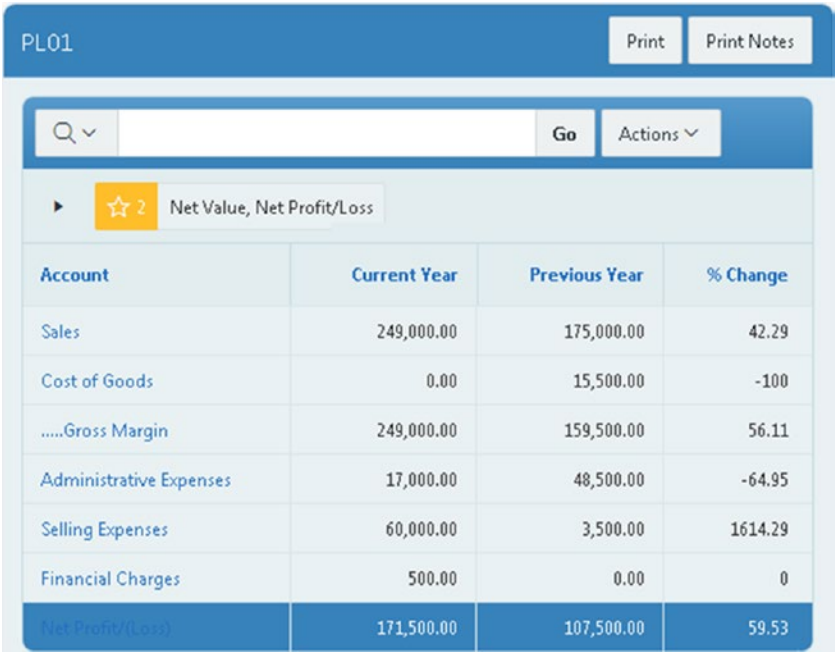
Table 28-2. *Interactive Report Region*

Action	Attribute	Value
Create Region	Title	&P76_REPORTCODE.
	Type	Interactive Report

	SQL Query	SELECT * from gl_fs_report
		WHERE upper(userid)=upper(:APP_USER) AND
		        notes=0 AND
		        reportcode=:P76_REPORTCODE
		ORDER BY srno

	Template	Standard
Create Button	Button Name	PRINT
	Label	Print
	Region	&P76_REPORTCODE.
	Button Position	Copy
	Action	Submit Page
Create Button	Button Name	PRINT_NOTES
	Label	Print Notes
	Region	&P76_REPORTCODE.
	Button Position	Copy
	Action	Submit Page

Modify the interactive report as shown in Figure 28-1 and save it by selecting the As Default Report Settings option followed by the Primary option.



Account	Current Year	Previous Year	% Change
Sales	249,000.00	175,000.00	42.29
Cost of Goods	0.00	15,500.00	-100
.....Gross Margin	249,000.00	159,500.00	56.11
Administrative Expenses	17,000.00	48,500.00	-64.95
Selling Expenses	60,000.00	3,500.00	1614.29
Financial Charges	500.00	0.00	0
Net Profit/(Loss)	171,500.00	107,500.00	59.53

Figure 28-1. *The interactive report*

28.4 Create Computations

The two financial statements are generated for the selected year (which is treated as the current year) along with comparative figures from the previous year. The computations listed in Table 28-3 are created to evaluate the proper periods from the fiscal year table and are used in the processes created in the next section.

***Table 28-3.** Computation Attributes*

Action	Attribute	Value
Create Computation	Item Name	P76_CURRENTFROMDATE
	Point	After Submit
	Computation Type	SQL Query (return single value)
	SQL Query	SELECT pfrom FROM gl_fiscal_year WHERE cocode=:P76_COCODE AND coyear=:P76_CURRENTYEAR AND comonthid=1
Create Computation	Item Name	P76_CURRENTTODATE
	Point	After Submit
	Computation Type	SQL Query (return single value)
	SQL Query	SELECT pto FROM gl_fiscal_year WHERE cocode=:P76_COCODE AND coyear=:P76_CURRENTYEAR AND comonthid=:P76_CURRENTMONTH
Create Computation	Item Name	P76_PREVIOUSFROMDATE
	Point	After Submit
	Computation Type	SQL Query (return single value)
	SQL Query	SELECT pfrom FROM gl_fiscal_year WHERE cocode=:P76_COCODE AND coyear=:P76_CURRENTYEAR-1 AND comonthid=1
Create Computation	Item Name	P76_PREVIOUSTODATE
	Point	After Submit
	Computation Type	SQL Query (return single value)
	SQL Query	SELECT pto FROM gl_fiscal_year WHERE cocode=:P76_COCODE AND coyear=:P76_CURRENTYEAR-1 AND comonthid=:P76_CURRENTMONTH
Create Computation	Item Name	P76_COMONTHNAME
	Point	After Submit
	Computation Type	SQL Query (return single value)
	SQL Query	SELECT comonthname FROM gl_ fiscal_year WHERE cocode=:P76_COCODE AND coyear=:P76_CURRENTYEAR AND comonthid=:P76_CURRENTMONTH

28.5 Create On-Demand Processes

Open the Shared Components interface. Click Application Processes in the Application Logic section to create two on-demand processes, as listed in Table 28-4. Note that these processes will be called from three different application pages.

Table 28-4. *On-Demand Process Attributes*

Action	Attribute	Value
Create Process	Name	Generate Profit and Loss
	Point	On Demand: Run this application process when requested by a page process.
	PL/SQL Code	Book_Code\Chapter28\Generate Profit and Loss.txt
	Condition Type	Current Page Is Contained Within Expression 1 (comma delimited list of pages)
	Expression 1	1,6,76 *(1=Desktop Home Page, 6=Mobile Home Page)*
Create Process	Name	Generate Balance Sheet
	Point	On Demand: Run this application process when requested by a page process.
	PL/SQL Code	Book_Code\Chapter28\Generate Balance Sheet.txt
	Condition Type	Current Page Is Contained Within Expression 1 (comma-delimited list of pages)
	Expression 1	1,6,76

ON-DEMAND SHARED PROCESSES

The Shared Components interface has an option called Application Processes. It has some process categories, one of which is On-Demand process, which lets you use the same PL/SQL code on multiple application pages. This way, the element of redundancy is eliminated from your application. Once created, these processes are called through some page-level processes. In APEX 4.2, there used to be a page-level process called On-Demand Process that was used to call such application-level processes on demand. When I initially created this application in APEX 4.2, the previous two processes were created as 13 individual processes for better readability and to avoid the 30,000 code limit. I used the On-Demand Process page-level option to call these 13 shared processes with just a single button click to produce both P&L and balance sheet statements. Unfortunately, this page-level option is not available in APEX 5.0. As a workaround, I merged those processes into the previous two and tweaked the calling process through a couple of branches (Table 28-5) that are invoked by two different buttons: Generate P&L and Generate Balance Sheet. Both the processes generate respective financial statements along with their corresponding notes to the accounts. However, the balance sheet process produces accurate results only when you first execute the P&L process using the Generate P&L button.

28.6 Create Branches

Using Table 28-5, create two branches on page 76 to run the previous on-demand processes. Right-click the Processing node and select Create Branch from the context menu. Set the following attributes for the new branches. The request (APPLICATION_PROCESS) calls the two on-demand processes to generate profit and loss and balance sheet statements along with respective notes. Note that the process name is case-sensitive and must be provided as it was set in the Name attribute in the previous section.

Table 28-5. *Branch Attributes*

Action	Attribute	Value
Create Branch	Name	Generate Profit and Loss
	Point	Processing
	Type	Page or URL (Redirect)
	Target	Type: **Page In This Application** Page: **76** Request (*under Advanced*): **APPLICATION_PROCESS=Generate Profit and Loss**
	When Button Pressed	PROFIT_LOSS
Create Branch	Name	Generate Balance Sheet
	Point	Processing
	Type	Page or URL (Redirect)
	Target	Type: **Page In This Application** Page: **76** Request (*under Advanced*): **APPLICATION_PROCESS=Generate Balance Sheet**
	When Button Pressed	BALANCE_SHEET

28.7 Create Page for Financial Statements Notes

Using Table 28-6, create a blank page and its components. This page is invoked from a link on page 76 (created in the next section) to browse the notes (details) of the selected account.

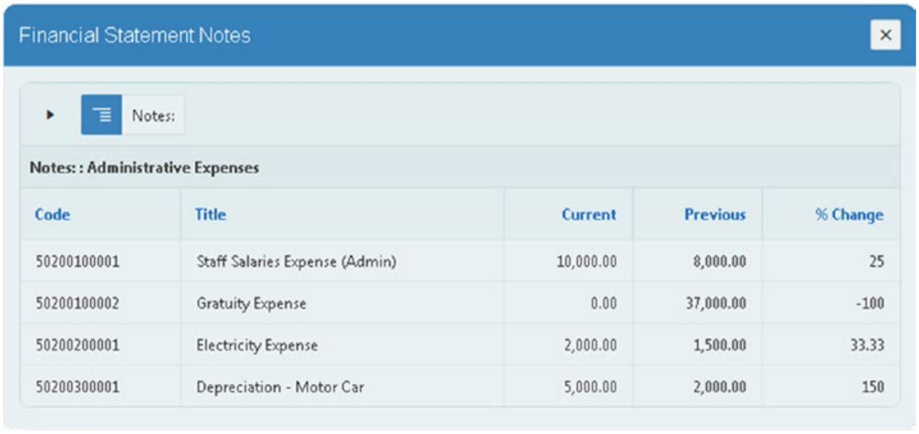
Table 28-6. *Page for Financial Statements Notes*

Action	Attribute	Value
Create Blank Page	Page Number	77
	Name	Financial Statement Notes
	Page Mode	Modal Dialog
	Breadcrumb	- do not use breadcrumbs on page -
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Reports
Create Region	Title	Notes to the Accounts
	Type	Interactive Report

	SQL Query	SELECT fsaccount, notescode, notestitle, currentbalance, previousbalance, percent
		FROM gl_fs_report
		WHERE upper(userid)=upper(:APP_USER) AND notes=1 AND fsaccount=:P77_FSACCOUNT
		ORDER BY notescode

Create Page Item	Name	P77_FSACCOUNT
	Type	Hidden
	Region	Notes to the Accounts

The notes page should look like Figure 28-2 after completing this chapter.



Notes: : Administrative Expenses

Code	Title	Current	Previous	% Change
50200100001	Staff Salaries Expense (Admin)	10,000.00	8,000.00	25
50200100002	Gratuity Expense	0.00	37,000.00	-100
50200200001	Electricity Expense	2,000.00	1,500.00	33.33
50200300001	Depreciation - Motor Car	5,000.00	2,000.00	150

Figure 28-2. *Notes page*

28.8 Create Column Link

Switch back to page 76 to convert the Account column into a link. Click the `FSACCOUNT` column and set the attributes listed in Table 28-7.

Table 28-7. *FSACCOUNT Column Attributes*

Action	Attribute	Value
Modify Report Column	Type	Link
	Target	Type = Page In This Application Page = 77 **Set Items** **Name** **Value** P77_FSACCOUNT #FSACCOUNT# Clear Cache = 77
	Link Text	#FSACCOUNT#

28.9 Generate PDF Report

Using Table 28-8, create three PDF reports. You can use the `.rtf` files provided with the book code to save some time.

Table 28-8. *PDF Versions*

Attribute	Value
Report Query Name	income_statement

SQL Query	SELECT * FROM gl_fs_report
	WHERE upper(userid)=upper(:APP_USER)
	AND notes=0 AND
	reportcode=:P76_REPORTCODE
	ORDER BY srno

XML File Name	income_statement.xml
Columns in RTF Template Table	Account, Current Balance, Previous Balance, and Percent
RTF File Name	income_statement.rtf
Branch Name	Run Income Statement
Point	After Processing
Branch Request	PRINT_REPORT=income_statement
When Button Pressed	PRINT
Condition Type	Item = Value
Item	P76_REPORTCODE
Value	PL01
Report Query Name	balance_sheet

SQL Query	SELECT * FROM gl_fs_report
	WHERE upper(userid)=upper(:APP_USER)
	AND notes=0 AND
	reportcode=:P76_REPORTCODE
	ORDER BY srno

XML File Name	balance_sheet.xml
Columns in RTF Template Table	Account, Current Balance, Previous Balance, and Percent
RTF File Name	balance_sheet.rtf
Branch Name	Run Balance Sheet
Point	After Processing
Branch Request	PRINT_REPORT=balance_sheet
When Button Pressed	PRINT
Condition Type	Item = Value
Item	P76_REPORTCODE
Value	BS01

(*continued*)

Table 28-8. (*continued*)

Attribute	Value
Report Query Name	financial_statement_notes

SQL Query	SELECT * FROM gl_fs_report
	WHERE upper(userid)=upper(:APP_USER)
	AND notes=1 AND
	reportcode=:P76_REPORTCODE
	ORDER BY srno

XML File Name	financial_statement_notes.xml
Columns in RTF Template Table	Account, Current Balance, Previous Balance, and Percent
RTF File Name	financial_statement_notes.rtf
Branch Name	Run Notes
Point	After Processing
Branch Request	PRINT_REPORT=financial_statement_notes
When Button Pressed	PRINT_NOTES

28.10 Enter Vouchers

Using the two files (`2015.PDF` and `2016.PDF`) provided in the book code (`Chapter28` folder), create some more vouchers to get a complete picture of the two financial statements. The file `2015.PDF` contains a couple of transactions related to expense accounts. These transactions should be posted in the previous year, in other words, 2015. Every time you create or amend an expense or revenue account in the previous year, the temporary year-end process must be executed to reflect these amendments in the profit and loss account. Failing to do so may result in inaccurate financial statements. After posting all vouchers from the two PDFs, switch back to 2015 and execute the temporary year-end process.

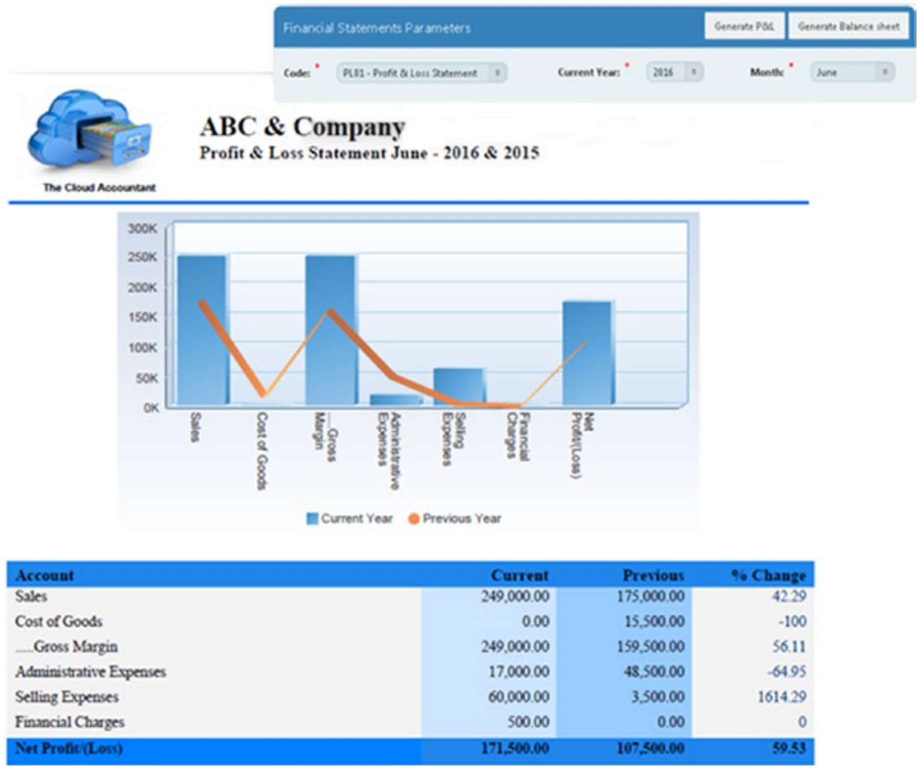
28.11 Test Your Work

Execute the following steps to test this part of the application:

1. Invoke it from the Reports ➤ Financial Statements menu.
2. Select PL01-Profit & Loss Statement from the Code list, select 2016 as the Current Year, and select June from the Month list, as illustrated in Figure 28-3 (top). Click the Generate P&L button to execute the corresponding process created in Chapter 28. The interactive report defined under the parameters region will be populated with the profit and loss report. The first column (Account) of this report is presented as a link that you defined in the "Create Column Link" section. This link was created to browse the details behind a selected account. Click the Sales link to see its notes.

3. To test the balance sheet report, switch the code to BS01-Balance Sheet. Keep the year and month parameters as is. To produce an accurate balance sheet statement, you must click both buttons. Click the Generate P&L button first to calculate the profit and loss figures that are reflected in the balance sheet. After clicking this button, the profit and loss report will appear in the interactive report. Next, click the Generate Balance Sheet button that invokes the corresponding on-demand process and presents the report on your screen.

4. Click the Print button to have a PDF version of the main financial report (shown at the bottom of Figure 28-3) currently displayed on your screen. The Print Notes button produces a PDF carrying the details of the selected report. I've provided all four PDFs in the book code (in the `Chapter28` folder).



Code: PL01 - Profit & Loss Statement
Current Year: 2016
Month: June

ABC & Company
Profit & Loss Statement June - 2016 & 2015

Account	Current	Previous	% Change
Sales	249,000.00	175,000.00	42.29
Cost of Goods	0.00	15,500.00	-100
___Gross Margin	249,000.00	159,500.00	56.11
Administrative Expenses	17,000.00	48,500.00	-64.95
Selling Expenses	60,000.00	3,500.00	1614.29
Financial Charges	500.00	0.00	0
Net Profit/(Loss)	171,500.00	107,500.00	59.53

***Figure 28-3.** Financial report*

28.12 Summary

The two financial reports you created in this chapter are the most wanted reports by the management of any organization. In the next chapter, you will finish this group with an executive dashboard comprising various analysis charts.

CHAPTER 29

Executive Dashboard

You created the two most vital accounting reports in the previous chapter. With the information provided by these reports, all stakeholders of an organization assess their business health. Among these stakeholders are the business executives who need some more information so that they can evaluate their business at a glance. To satisfy the need of these key stakeholders, you will create an executive dashboard in this chapter to graphically present the information they are looking for.

29.1 Dashboard Table

This segment will use the following table that has already been added to the database through the script file:

DASHBOARD TABLE

```
CREATE TABLE gl_dashboard
(srno NUMBER, accountTitle varchar2(50), currentYear number(15,2),
previousYear number(15,2), userid varchar2(50), ratioTitle varchar2(50),
current_year number(15,2), previous_year number(15,2))
```

29.2 Copy Components to the Home Page

This segment will be created in the Home page (page 1), which already exists in your application. What's more, it uses the same processes and page components used in the previous chapter, which means that you are not required to re-create them. If you look at the bottom part of the two on-demand processes (Chapter 28), you will find three code blocks labeled P&L Account Balances, P&L Ratios, and Balance Sheet Ratios. These are the PL/SQL blocks that relate to this segment. After calculating figures for the two financial statements, these blocks are executed to calculate figures that appear in different charts on the Home page.

Usually you modify a page to add components to it. But this time you are going to learn how to use the Copy to other Page option to copy a whole region along with its components from page 76 to the Home page.

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R. Ahmed, *Cloud Computing Using Oracle Application Express*,
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1. On -age 76, right-click the region named Financial Statements Parameters and select the option labeled Copy to other Page... from the context menu. Set the attributes listed in Table 29-1. Once finished, edit the Home page where you will see the copied region with all of its components.

Table 29-1. *Copy Region*

Attribute	Value
To Page	1
Copy Region Items	Yes
Copy Buttons	Yes
Region Name	Dashboard Parameters

2. Click the Dashboard Parameters region on the Home page and change its Type from Static Content to Region Display Selector. Scroll down in the Properties pane and set Region Display Selector to No. Setting the Type attribute to Region Display Selector displays region names in a horizontal list, enabling end users to select one region to display and hide other regions. Only page regions with their Region Display Selector attribute set to Yes will be displayed in the horizontal list.

3. Repeat the previous step to copy the five computations from page 76 to page 1, considering the attributes listed in Table 29-2. After copying these computations, go to page 1 and amend their respective SQL queries by replacing the P76 prefix with P1 to point to the items on the Home page.

Table 29-2. *Copy Computations*

Attribute	Value
Copy Computation	P76_CURRENTFROMDATE ... P76_COMONTHNAME
Target Page	1 *(same for all 5 computations)*
Target Computation Sequence	10 ... 50
Target Item to be Computed	P1_CURRENTFROMDATE ... P1_COMONTHNAME

4. Copy the two branches (Generate Profit and Loss and Generate Balance Sheet, listed in Table 29-3) from page 76 to the Home page. After creation, change the Page attribute (under Target) from 76 to **1** in both branches.

Table 29-3. *Copy Branches*

Attribute	Value
Copy Branch	Generate Profit and Loss
Target Page	1
Target Page Branch Sequence	10
When Button Pressed	PROFIT_LOSS (Generate P&L)
Copy Branch	Generate Balance Sheet
Target Page	1
Target Page Branch Sequence	20
When Button Pressed	BALANCE_SHEET (Generate Balance Sheet)

29.3 Create Regions

Right-click the main Regions node and select Create Region to create two regions (as mentioned in Table 29-4) on the Home page.

Table 29-4. *Region Attributes*

Action	Attribute	Value (Region 1)	Value (Region 2)
Create Region	Title	Profit & Loss Trend	Ratio Analysis
	Type	Static Content	Static Content
	Parent Region	-Select- *(in other words, no parent region)*	-Select-
	Region Display Selector	Yes	Yes

29.4 Create Chart Subregion

This region will display the current year's profit and loss accounts in a pie chart. To create this region, right-click the Profit & Loss Trend region and select Create Sub Region from the context menu. Set the attributes listed in Table 29-5 for the new region.

Table 29-5. *Subregion Attributes*

Attribute	Value
Title	<b>Year&**P1_CURRENTYEAR**.</b>
Type	Chart
Parent Region	Profit & Loss Trend
Body Height *(in Template Options)*	240px
Column Span	6
New Node:	
Source Type	SQL Query
SQL Query	SELECT null, accounttitle, **currentyear** FROM gl_dashboard WHERE userid=:APP_USER AND srno BETWEEN 1 AND 11 ORDER BY by srno
Attributes Node:	
Chart Type	Pie
Rendering	Flash Chart
3D Mode	Yes
Width	550
Height	200
Series Color Scheme	Look 6
Label Show	No
Value Show	No

29.5 Create a Hidden Item

The chart to be created later in the chapter (Table 29-7) will display the P&L trend for the previous year. Create the hidden item (as listed in Table 29-6) to assess the previous year value.

Table 29-6. *Hidden Item Attributes*

Action	Attribute	Value
Create Page Item	Name	P1_PREVIOUSYEAR
	Type	Hidden
	Region	Dashboard Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT :P1_CURRENTYEAR - 1 FROM dual

29.6 Copy Chart Regions

Right-click the region Year&P1_CURRENTYEAR. and click the Duplicate option in the context menu. A copy of the existing region will be created under it with the same name. Set the attributes listed in Table 29-7 for the new region, keeping all others as is.

Table 29-7. *Region Attributes*

Attribute	Value
Title	<b>Year&**P1_PREVIOUSYEAR**.</b>
Start New Row	No
SQL Query	SELECT null, accounttitle, **previousyear** FROM gl_dashboard WHERE userid=:APP_USER AND srno BETWEEN 1 AND 11 ORDER BY srno

Duplicate any existing chart, such as Year&P1_PREVIOUSYEAR, and set the attributes listed in Table 29-8. This chart will render the current revenue trend.

Table 29-8. *Revenue Trend Attributes*

Attribute	Value
Title	<b>Revenue Trend</b>
Type	Chart
Parent Region	Profit & Loss Trend
Body Height *(in Template Options)*	320px
Column Span	6
New Node:	
Source Type	SQL Query
SQL Query	SELECT null, accounttitle, currentyear, previousyear FROM gl_dashboard WHERE userid=:APP_USER AND srno=1
Attributes Node:	
Chart Type	Column
Rendering	Flash Chart
Show Grid	Y-Axis
Show Scrollbars	None
Width	450

(*continued*)

Table 29-8. (*continued*)

Attribute	Value
Height	300
Series Color Scheme	Look 2
Label Show	Yes
Legend Show	Top
Element Orientation	Horizontal

Make a duplicate of the Revenue Trend chart and set the attributes listed in Table 29-9. As the name implies, this chart will show the expenses trend.

Table 29-9. *Expenses Trend Attributes*

Attribute	Value
Title	<b>Expenses Trend</b>
Start New Row	No
New Node:	
SQL Query	SELECT null, accounttitle, currentyear, previousyear FROM gl_dashboard WHERE userid=:APP_USER AND (srno=3 or srno=8 or srno=9 or srno=10)
Attributes Node:	
Series Color Scheme	Look 6
Label Rotation	20 (degrees)

Make a copy of Revenue Trend and set the attributes listed in Table 29-10. This region will show the gross profit ratio. All the regions from this point will be placed under the Ratio Analysis region.

Table 29-10. *Gross Profit Ratio Attributes*

Attribute	Value
Title	<b>Gross Profit Ratio</b>
Parent Region	Ratio Analysis
Body Height *(in Template Options)*	320px
Column Span	4

(*continued*)

Table 29-10. (*continued*)

Attribute	Value
New Node:	
SQL Query	SELECT null, accounttitle, current_year, previous_year FROM gl_dashboard WHERE userid=:APP_USER AND **srno=50**
Attributes Node:	
Width	300
Height	300
Series Color Scheme	Custom
Custom	#08A03D, #398F84
Decimal Places (under Y-Axis)	2
Label Show	No
Value Show	Yes
Font Color	#FFFFFF
Tooltip Show	No
Legend Show	Top
Element Orientation	Horizontal

Make a duplicate of Gross Profit Ratio to create Operating Profit Ratio. Incorporate the attributes listed in Table 29-11 in the new region.

Table 29-11. *Operating Profit Ratio Attributes*

Attribute	Value
Title	<b>Operating Profit Ratio</b>
Start New Row	No
New Node:	
SQL Query	SELECT null, accounttitle, current_year, previous_year FROM gl_dashboard WHERE userid=:APP_USER AND **srno=52**
Attributes Node:	
Custom (under Series Color)	#73000F, #B31919

Make a duplicate of the Operating Profit Ratio region to create the Net Profit Ratio region with the distinctions listed in Table 29-12.

Table 29-12. *Net Profit Ratio Chart Attributes*

Attribute	Value
Title	<b>Net Profit Ratio</b>
New Node:	
SQL Query	SELECT null, accounttitle, current_year, previous_year FROM gl_dashboard WHERE userid=:APP_USER AND **srno=53**
Attributes Node:	
Series Color Scheme	Look 2

Make the Current Ratio region from Gross Profit Ratio considering the distinctions listed in Table 29-13.

Table 29-13. *Current Ratio Attributes*

Attribute	Value
Title	<b>Current Ratio</b>
Sequence	100
New Node:	
SQL Query	SELECT null, accounttitle, current_year, previous_year FROM gl_dashboard WHERE userid=:APP_USER AND **srno=60**
Attributes Node:	
Legend Show	None

Using Table 29-14, make the Net Working Capital region from Operating Profit Ratio.

***Table 29-14.** Net Working Capital Attributes*

Attribute	Value
Title	<b>Net Working Capital</b>
Sequence	110
New Node:	
SQL Query	SELECT null, accounttitle, current_year, previous_year FROM gl_dashboard WHERE userid=:APP_USER AND **srno=62**
Attributes Node:	
Font Color	#000000
Legend Show	None

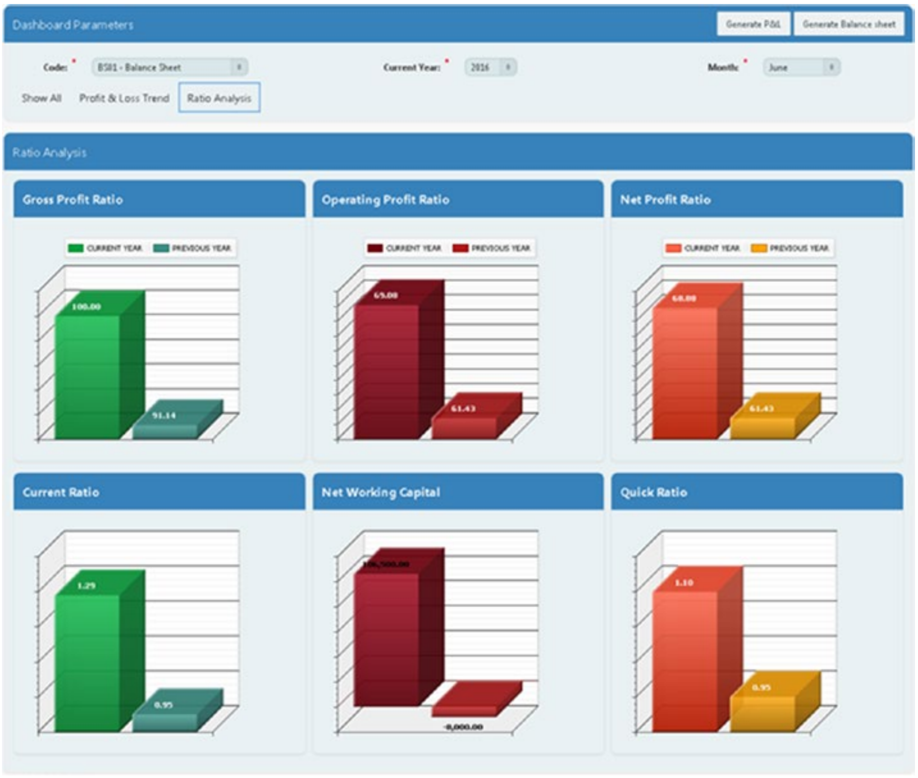
Make the Quick Ratio region from Net Profit Ratio, using Table 29-15.

***Table 29-15.** Quick Ratio Attributes*

Attribute	Value
Title	<b>Quick Ratio</b>
Sequence	120
New Node:	
SQL Query	SELECT null, accounttitle, current_year, previous_year FROM gl_dashboard WHERE userid=:APP_USER AND **srno=63**
Attributes Node:	
Legend Show	None

29.7 Test Your Work

Click the application title The Cloud Accountant on the top of your screen to see the Home page. Select BS01-Balance Sheet, 2016, and June for Code, Current Year, and Month, respectively. Hit the Generate P&L button. Once the page gets refreshed, hit the Generate Balance Sheet button. If Region Display Selector is set to the default Show All option, then you'll see all ten charts on your screen. Click the option Profit & Loss Trend in the region selector. This action will hide the six charts created under the Ratio Analysis region. Similarly, if you click the Ratio Analysis option (Figure 29-1), the four charts created under the Profit & Loss Trend region will be hidden.


Dashboard Parameters

Code: BS01 - Balance Sheet

Current Year: 2016

Month: June

Figure 29-1. *Ratio Analysis charts*

29.8 Summary

The charts you added to the Home page provide insight into an organization's financial status. Here you learned how to create different types of analyses for management. In the next chapter, you will create a feedback module that allows interaction among application users.

CHAPTER 30

Application Feedback

This segment is added to create interaction among the application administrator and its users. It allows end users to communicate application issues to the application administrator. It consists of a form and a report. The form is created for the users to input their feedback, while the report is used by the application administrator to browse the issues added through the form.

30.1 Application Feedback Table

The following table and sequence were created through the script file to store application feedback received from the users of the application:

FEEDBACK TABLE

```
CREATE TABLE gl_feedback
(feedbackID NUMBER, TS timestamp default sysdate, custName varchar2(50),
custEmail varchar2(100), custFeedback varchar2(4000), CONSTRAINT GL_
FEEDBACK_PK PRIMARY KEY (feedbackID) ENABLE)

CREATE SEQUENCE gl_feedback_seq
```

30.2 Create Feedback Input Form

Using Table 30-1, create a new page. On the first wizard page, select Form, and on the next page, select Form on a Table or View.

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Table 30-1. *Page Attributes*

Action	Attribute	Value
Create Page	Table/View owner	*Accept the displayed value*
	Table/View Name	GL_FEEDBACK (table)
	Page Number	300
	Page Name	Application Feedback
	Page Mode	Normal
	Region Title	Application Feedback
	Navigation Preference	Do not associate this page with a navigation menu entry
	Primary Key Type	Select Primary Key Column(s)
	Primary Key Column 1	FEEDBACKID
	Source for Primary Key Column 1	Existing Sequence
	Sequence	GL_FEEDBACK_SEQ
	Form Columns	Select all columns
	Buttons	*Accept all default values*
	Branch here on Submit	1
	Branch here on Cancel	1

Modify the feedback page as follows:

1. Change the Type value of the timestamp field (P300_TS) to Hidden. Set the Default Type value of this item to PL/SQL Expression and enter **sysdate** as the value for the PL/SQL Expression attribute to store the current system date for each feedback.

2. Set the labels of the three text items to **Customer**, **Email**, and **Feedback**. Also set Template to Required and Value Required to Yes for these three Text Field items.

3. Select the P300_CUSTFEEDBACK item and set its Height attribute to 20 lines.

4. Click the process named Process Row of GL_FEEDBACK on the Processing tab. Type **Thank you very much for providing your valuable feedback** in the Success Message box.

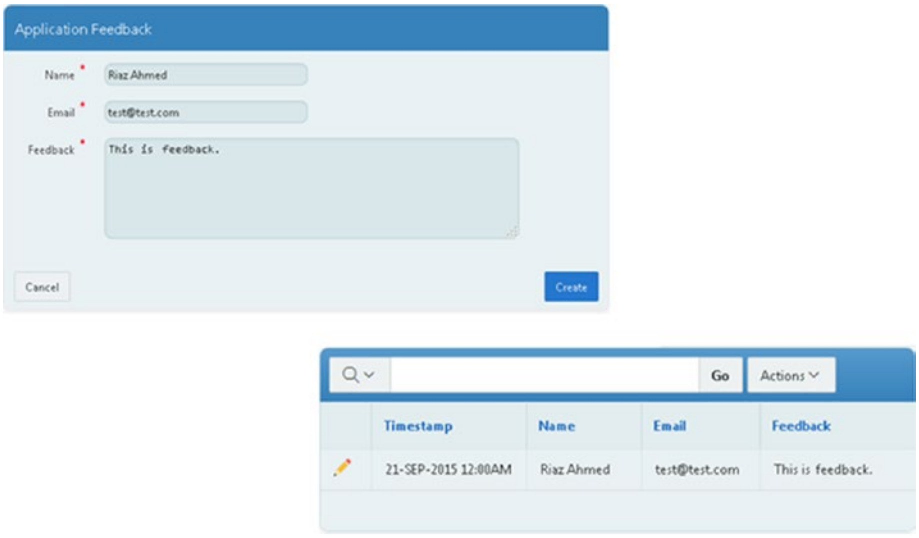
30.3 Create Feedback Report Page

Next, create an interactive report page to display a list of all feedback entered through page 301. This report allows an administrator to see and reply to the users' feedback. Click the Create Page button. Select the Report option on the first wizard screen followed by the Interactive Report option. Set the attributes as listed in Table 30-2.

Table 30-2. *Feedback Report Page Attributes*

Action	Attribute	Value
Create Page	Page Number	300
	Page Name	Feedback Report
	Page Mode	Normal
	Region Name	Feedback Report
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Reports
	SQL Query	SELECT * FROM gl_feedback

Modify the feedback report page by changing the column headings as shown in Figure 30-1 (bottom).



Name * Riaz Ahmed
Email * test@test.com
Feedback * This is feedback.

Timestamp	Name	Email	Feedback
21-SEP-2015 12:00AM	Riaz Ahmed	test@test.com	This is feedback.

Figure 30-1. *Feedback report page*

30.4 Test Your Work

Click the Feedback link in the navigation bar to run the feedback input form. Enter your name, e-mail address, and some text such as **This is feedback** (shown earlier at the top of Figure 30-1), and click the Create button. An acknowledgment message will appear indicating that your feedback was received. Expand the Reports menu and click the Feedback option to see the feedback you just saved.

30.5 Summary

In this chapter, you learned how application users can interact with each other to discuss application issues. In the next chapter, you will create a small footprint of the application that is accessible on smartphones.

CHAPTER 31

Mobile Version

With mobile web usage incrementing every year, there is a huge demand in the market for applications supported on smartphones and tablets. To help develop new applications and extend existing web applications for mobile use, Oracle APEX is enhanced with mobile development features. Now you can easily build applications for modern smartphones and tablets, such as the iPhone, iPad, Android, and so on, using Oracle APEX. In this chapter, you'll get a taste of this handy feature by creating some high-end graphical financial reports for the busy business community to keep them in touch with their businesses while on the road.

31.1 Create an Interface for a Mobile Application

Oracle APEX allows you to create two types of interfaces: desktop and mobile. Each page in an application is associated with one user interface. If a user logs into the application with a mobile device, the pages created with the mobile interface will be rendered; for big screens, the desktop user interface is used. You developed the desktop interface in each of the previous chapters. Now you'll use the mobile interface to build a mobile version.

1. Click the Edit Application Properties button in the main Application Builder interface.
2. Click the User Interface tab.
3. Click the Add User Interface button.
4. On the User Interface page, set the attributes listed in Table 31-1, and click Next.

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***Table 31-1.** Mobile UI Attributes*

Attribute	Value
Type	Mobile
Display Name	Mobile (*the display name is shown in page creation wizards*)
Auto Detect	Yes
Home URL	f?p=&APP_ID.:HOME_JQM_SMARTPHONE:&SESSION. (*Specifies the home page of the application for the mobile user interface*)
Login URL	f?p=&APP_ID.:LOGIN_JQM_SMARTPHONE:&SESSION. (*Points toward the login page of the application for the mobile user interface*)

5. On the Identify Theme page, select Standard Themes for Theme Type, and select Mobile (Theme 51) as the mobile application theme. Click Next.
6. Click Create.

Just like the desktop application, the mobile interface is also created with two default pages: Home (page 6 in my application) and Login (page 1001). In addition to these pages, the wizard creates a third one: Global Page - Mobile (page 9999).

■ **Note** You may get the error "Unable to create theme. ORA-00001: unique constraint (APEX_050000.WWV_FLOW_PAGE_PLUG_IDX2) violated while creating the mobile interface." Only the APEX administrator can fix this error. As a workaround, you can create the mobile version by creating a mobile application from the Application Builder (Application Builder ➤ Create ➤ Mobile). Note that the mobile version will have a new ID and you have to link it with the Mobile navigation bar entry by setting the Target Type attribute to URL and the URL Target attribute to `https://apex.oracle.com/pls/apex/f?p=2506:1`, where 2506 is the ID of your mobile application. You also need to create the two processes (Generate Balance Sheet and Generate Profit and Loss) in the mobile application and amend them accordingly.

31.2 Region and Page Items

The mobile version of the general ledger application will show some crucial reports to business executives on their mobile devices. After a successful login attempt, the user will select three values from the home page parameters: Company, Year, and Month. Then the user can click two buttons (Profit & Loss and Balance Sheet) to generate the data for the selected parameters. The mobile version has a slider menu on the top left of the screen. The menu will display a set of report options that you'll define using Table 31-3. Clicking these options will fetch the appropriate data from the base table. The rest of the procedure is similar to the one you used in the previous chapter while creating the desktop executive dashboard. Let's start by creating a region on the mobile home page (page 6) and adding some page items using Table 31-2.

■ **Note** Use an item prefix for page items and in SQL queries according to your mobile page number.

Table 31-2. *Region and Item Attributes*

Action	Attribute	Value
Create Region	Title	Mobile Parameters
	Type	Static Content
	Template	Standard
Create Page Item	Name	P6_COMPANY
	Type	Select List
	Label	Company
	Region	Mobile Parameters
	Start New Row	Yes
	Column	Automatic
	LOV Type	SQL Query
	SQL Query	SELECT coname, cocode FROM gl_company ORDER BY cocode
	Source Type	SQL Query (return single value)
	SQL Query	SELECT cocode FROM gl_users WHERE userid=:APP_USER
	Source Used	Only when current value in session state is null

(*continued*)

Table 31-2. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P6_CURRENTYEAR
	Type	Select List
	Label	Year
	Region	Mobile Parameters
	Start New Row	Yes
	Column	Automatic
	LOV Type	SQL Query

	SQL Query	SELECT DISTINCT(coyear) d, coyear r FROM gl_fiscal_year
		WHERE cocode=:P6_COMPANY ORDER BY coyear

	Cascading LOV Parent Item(s)	P6_COMPANY
	Source Type	SQL Query (return single value)
	SQL Query	SELECT coyear FROM gl_users WHERE userid=:APP_USER
	Source Used	Only when current value in session state is null
	SQL Query	SELECT cocode FROM gl_users WHERE userid=:APP_USER
Create Page Item	Name	P6_CURRENTMONTH
	Type	Select List
	Label	Month
	Region	Mobile Parameters
	Start New Row	Yes
	Column	Automatic
	LOV Type	SQL Query

	SQL Query	SELECT DISTINCT(comonthname) d, comonthid r FROM gl_fiscal_year
		WHERE cocode=:P6_COMPANY
		ORDER BY comonthid

	Cascading LOV Parent Item(s)	P6_COMPANY
	Source Type	SQL Query (return single value)
	SQL Query	SELECT comonthid FROM gl_users WHERE userid=:APP_USER
	Source Used	Only when current value in session state is null

(*continued*)

Table 31-2. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P6_COCODE
	Type	Hidden
	Region	Mobile Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT cocode FROM gl_users WHERE userid=:APP_USER
Create Page Item	Name	P6_CONAME
	Type	Hidden
	Region	Mobile Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT coname FROM gl_company WHERE cocode=(select cocode from gl_users where upper(userid)=upper (:APP_USER))
Create Page Item	Name	P6_CURRENTFROMDATE
	Type	Hidden
	Region	Mobile Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT pfrom FROM gl_fiscal_year WHERE cocode=:P6_COCODE and coyear=:P6_CURRENTYEAR AND comonthid=1
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P6_CURRENTTODATE
	Type	Hidden
	Region	Mobile Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT pto FROM gl_fiscal_year WHERE cocode=:P6_COCODE AND coyear=:P6_CURRENTYEAR AND comonthid=:P6_CURRENTMONTH
	Source Used	Always, replacing any existing value in session state

(*continued*)

Table 31-2. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P6_PREVIOUSFROMDATE
	Type	Hidden
	Region	Mobile Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT pfrom FROM gl_fiscal_year WHERE cocode=:P6_COCODE AND coyear=:P6_ CURRENTYEAR-1 AND comonthid=1
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P6_PREVIOUSTODATE
	Type	Hidden
	Region	Mobile Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT pto FROM gl_fiscal_year WHERE cocode=:P6_COCODE AND coyear=:P6_ CURRENTYEAR-1 AND comonthid=:P6_CURRENTMONTH
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P6_COMONTHNAME
	Type	Hidden
	Region	Mobile Parameters
	Source Type	SQL Query (return single value)
	SQL Query	SELECT comonthname FROM gl_fiscal_year WHERE cocode=:P6_COCODE AND coyear=:P6_ CURRENTYEAR AND comonthid=:P6_CURRENTMONTH
	Source Used	Always, replacing any existing value in session state
Create Button	Button Name	PROFIT_LOSS
	Label	Profit & Loss
	Region	Mobile Parameters
	Button Position	Bottom of Region
	Action	Submit Page

(*continued*)

Table 31-2. *(continued)*

Action	Attribute	Value
Create Button	Button Name	BALANCE_SHEET
	Label	Balance sheet
	Region	Mobile Parameters
	Button Position	Bottom of Region
	Action	Submit Page

31.3 Copy Computations and Branches

Copy the five computations across from page 76 as you did in the previous chapter. Replace the P76 prefix with P6 in all SQL queries to point to the items on the mobile home page. Also, copy the two branches (Generate Profit and Loss and Generate Balance Sheet) from page 76 to the mobile home page. Do not forget to change the Page attribute (under Target) from 76 to 6 in both branches.

31.4 Add Entries to Mobile Navigation Menu

Select the Mobile Navigation menu from the Shared Components ➤ Navigation menu. Click the Create List Entry button and add the entries listed in Table 31-3 one after the other to the navigation menu.

Table 31-3. *Mobile Navigation Menu*

List Entry Label	Page
Profit & Loss Statement	103
Revenue Trend	104
Expense Trend	105
Gross Profit Ratio	106
Operating Profit Ratio	107
Net Profit Ratio	108
Current Ratio	109
Net Working Capital	110
Quick Ratio	111

31.5 Create Profit and Loss Statement Report

Using Table 31-4, create the first mobile report page to display the P&L statement. The report consists of a bar chart and a column toggle report. By setting a region to the Column Toggle Report type, you specify the most important columns and those that will be hidden as necessary on smaller screens.

Table 31-4. *Mobile Report Page*

Action	Attribute	Value
Create Blank Page	Page Number	103
	Name	Profit & Loss Statement
	Page Mode	Normal
	Navigation Preference	Identify an existing navigation menu entry for this page
	Existing Navigation Menu Entry	Profit & Loss Statement
Create Region	Title	Profit & Loss Statement
	Type	Chart
	New Node:	
	Source Type	SQL Query
	SQL Query	SELECT null, accounttitle, currentyear, previousyear FROM gl_dashboard WHERE userid=:APP_USER AND srno BETWEEN 1 AND 11 ORDER BY srno
	Attributes Node:	
	Chart Type	Column
	Rendering	HTML5 Chart
	3D Mode	Yes
	Series Color Scheme	Custom
	Custom	#025391,#0587EB
Create Page Item	Name	P103_CONAME
	Type	Text Field
	Label	<b>Company</b>
	Region	Profit & Loss Statement
	Source Type	Item
	Item	P6_CONAME
	Source Used	Always, replacing any existing value in session state

(*continued*)

Table 31-4. (*continued*)

Action	Attribute	Value
Create Page Item	Name	P103_CURRENTYEAR
	Type	Text Field
	Label	<b>Current</b>
	Region	Profit & Loss Statement
	Source Type	Item
	Item	P6_CURRENTYEAR
	Source Used	Always, replacing any existing value in session state
Create Page Item	Name	P103_PREVIOUSYEAR
	Type	Text Field
	Label	<b>Previous</b>
	Region	Profit & Loss Statement
	Source Type	PL/SQL Expression
	PL/SQL Expression	P103_CURRENTYEAR -1
	Source Used	Always, replacing any existing value in session state
Create Region	Title	P&L Report
	Type	Column Toggle Report
	SQL Query	SELECT accounttitle, currentyear, previousyear FROM gl_dashboard WHERE userid=:APP_USER AND srno BETWEEN 1 AND 11 ORDER BY srno

31.6 Create Other Mobile Report Pages

Edit page 103, click the Create menu , and select the option Page as Copy. Follow the wizard and set the attributes shown in Table 31-5.

***Table 31-5.** Revenue Trend Report Attributes*

Attribute	Value
Create a page as a copy of	Page in this application
Copy from Page	103. Profit & Loss Statement
Copy to New Page Number	104
New Page Name	Revenues Trend
User Interface	Mobile
Breadcrumb	- do not use breadcrumbs on page -
Chart Region's New Value	Revenues Trend
Report Region's New Value	Revenues Report

On page 104, modify the two SQL queries as indicated in Table 31-6.

***Table 31-6.** SQL Queries*

Component	SQL Query

New node (under Revenue Trend)	SELECT null, accounttitle, currentyear, previousyear
	FROM gl_dashboard
	WHERE userid=:APP_USER AND srno=1

Revenue Report	SELECT accounttitle, currentyear, previousyear
	FROM gl_dashboard
	WHERE userid=:APP_USER AND srno=1

Copy page 104 to 105 (Expenses Trend) using the values specified in Table 31-7.

***Table 31-7.** Expenses Trend Report Attributes*

Attribute	Value
Copy to New Page Number	105
New Page Name	Expenses Trend
Chart Region's New Value	Expenses Trend
Report Region's New Value	Expenses Report

SQL Query - Expenses Trend	SELECT null, accounttitle, currentyear, previousyear
	FROM gl_dashboard
	WHERE userid=:APP_USER AND (srno=3 or srno=8 or srno=9 or srno=10)

SQL Query - Expenses Report	SELECT accounttitle, currentyear, previousyear
	FROM gl_dashboard
	WHERE userid=:APP_USER and (srno=3 or srno=8 or srno=9 or srno=10)

Create a Gross Profit Ratio report from Page 105 using Table 31-8.

Table 31-8. *Gross Profit Ratio Report Attributes*

Attribute	Value
Copy to New Page Number	106
New Page Name	Gross Profit Ratio
Chart Region's New Value	Gross Profit Ratio
Report Region's New Value	Gross Profit Report
Decimal Places (under Attributes)	2

SQL Query - Gross Profit Ratio	SELECT null, ratiotitle, current_year, previous_year
	FROM gl_dashboard
	WHERE userid=:APP_USER AND srno=50

SQL Query - Gross Profit Report	SELECT ratiotitle, currentyear, previousyear
	FROM gl_dashboard
	WHERE userid=:APP_USER AND srno=50

Create an Operating Profit Ratio report from Page 106 using Table 31-9.

Table 31-9. *Operating Profit Ratio Report Attributes*

Attribute	Value
Copy to New Page Number	107
New Page Name	Operating Profit Ratio
Chart Region's New Value	Operating Profit Ratio
Report Region's New Value	Operating Profit Report

SQL Query - Operating Profit Ratio	SELECT null, ratiotitle, current_year, previous_year
	FROM gl_dashboard
	WHERE userid=:APP_USER AND srno=52

SQL Query - Operating Profit Report	SELECT ratiotitle, currentyear, previousyear
	FROM gl_dashboard
	WHERE userid=:APP_USER AND srno=52

Create a Net Profit Ratio report from page 106 using Table 31-10.

Table 31-10. *Net Profit Ratio Report Attributes*

Attribute	Value
Copy to New Page Number	108
New Page Name	Net Profit Ratio
Chart Region's New Value	Net Profit Ratio
Report Region's New Value	Net Profit Report

SQL Query - Net Profit Ratio	SELECT null, ratiotitle, current_year, previous_year
	FROM gl_dashboard
	WHERE userid=:APP_USER AND srno=53

SQL Query - Net Profit Report	SELECT ratiotitle, currentyear, previousyear
	FROM gl_dashboard
	WHERE userid=:APP_USER AND srno=53

Create a Current Ratio report from Page 106 using Table 31-11.

Table 31-11. *Current Ratio Report Attributes*

Attribute	Value
Copy to New Page Number	109
New Page Name	Current Ratio
Chart Region's New Value	Current Ratio
Report Region's New Value	Current Ratio Report

SQL Query - Current Ratio	SELECT null, ratiotitle, current_year, previous_year
	FROM gl_dashboard
	WHERE userid=:APP_USER AND srno=60

SQL Query - Current Ratio Report	SELECT accounttitle, currentyear, previousyear
	FROM gl_dashboard
	WHERE userid=:APP_USER AND (srno=60 or srno=61)

Create Net Working Capital report from page 109 using Table 31-12.

Table 31-12. *Net Working Capital Report Attributes*

Attribute	Value
Copy to New Page Number	110
New Page Name	Net Working Capital
Chart Region's New Value	Net Working Capital
Report Region's New Value	Net Working Capital Report
SQL Query - Net Working Capital	SELECT null, ratiotitle, current_year, previous_year FROM gl_dashboard WHERE userid=:APP_USER AND srno=62
SQL Query - Net Working Capital Report	SELECT accounttitle, currentyear, previousyear FROM gl_dashboard WHERE userid=:APP_USER AND (srno=60 or srno=61)

Create a Quick Ratio report from page 109 using Table 31-13.

Table 31-13. *Quick Ratio Report Attributes*

Attribute	Value
Copy to New Page Number	111
New Page Name	Quick Ratio
Chart Region's New Value	Quick Ratio
Report Region's New Value	Quick Ratio Report
SQL Query - Quick Ratio	SELECT null, ratiotitle, current_year, previous_year FROM gl_dashboard WHERE userid=:APP_USER AND srno=63
SQL Query - Quick Ratio Report	SELECT accounttitle, currentyear, previousyear FROM gl_dashboard WHERE userid=:APP_USER AND (srno=61 or srno=63) ORDER BY srno DESC

31.7 Test Your Work

Execute the mobile application from the Mobile option available in the desktop navigation bar. Enter the same username and password that you have been using until now. Select ABC & Company, 2016, and June for the Company, Year, and Month parameters, respectively. Click the Profit & Loss button to generate profit and loss figures. Then click the Balance Sheet button to execute the corresponding process. From the mobile menu, click the first option labeled Profit & Loss Statement (on the left of Figure 31-1). This action will run page 103 containing a bar chart and a column toggle report, as shown on the right of Figure 31-1. Click all the remaining reports appearing in the menu to check your work. Note that you are not required to select the three parameters or hit the two buttons for each report individually. It's a one-time process that must be reexecuted when you change any of the available three parameters.

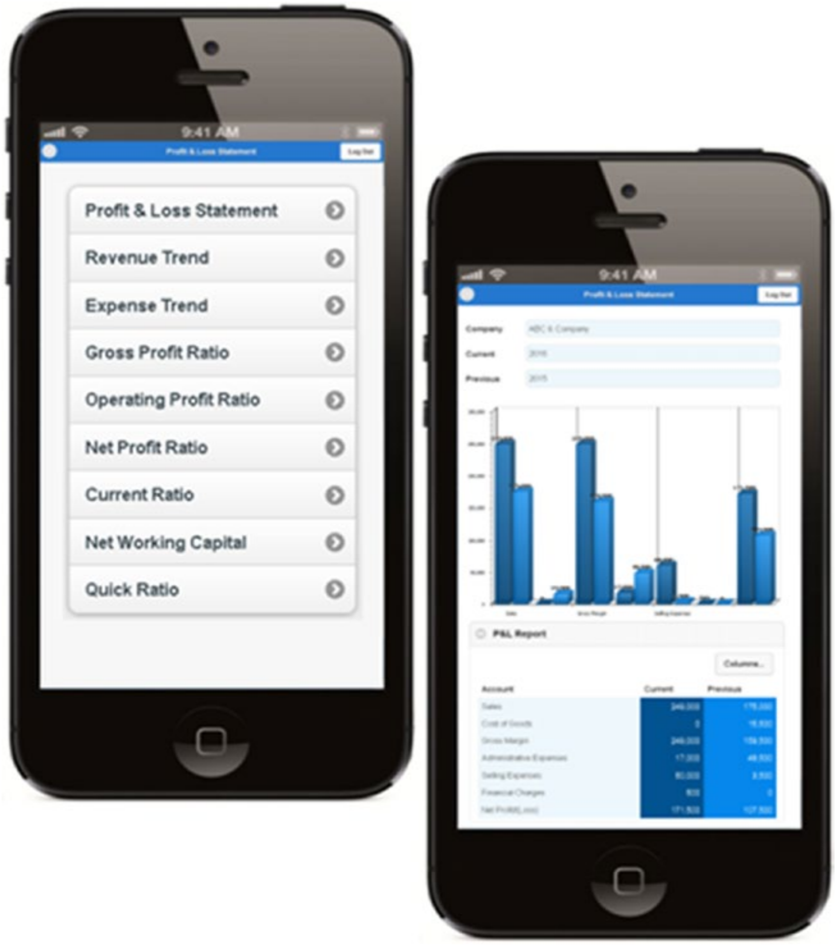


Figure 31-1. *Mobile menu (left) and charts (right)*

31.8 Summary

The mobile version created in this chapter was aimed at higher management to keep them in touch with their businesses when they are away from their offices. The final chapter of this book discusses the security of the application.

CHAPTER 32

Application Security

Before you go live with an application, it is important to apply proper security measures. One of the most basic forms of protection that any web application must have is the enforcement of an authentication and authorization policy. *Authentication* deals with identifying users to the application; you've already implemented it in this application using a custom authentication scheme: a username and password. *Authorization* is the process of assessing whether the authenticated user is privileged to access certain data or perform a particular action. Recall that you have already laid the foundation of application authorization in Chapter 6 where you specified the application segments to which you want to apply authorization. Then, you created user groups and provided them with the appropriate application access privileges. In this chapter, you will create a bunch of authorization schemes to protect your application. These schemes will be created to protect menus, pages, buttons, and processes.

32.1 Authorization Schemes for the Main Menu

First you will create some authorization schemes to control access to the menu options of your application. Note that you have 9 main menus and 26 submenu options in the application. These all need to be protected through individual authorization schemes to prevent unauthorized application access. In this section, you will create authorization schemes for the nine main menu options. The submenu options will be controlled through the Page Access authorization scheme, as listed in Table 32-4 later in this chapter. Use the table to create these authorization schemes. The code for all these schemes is the same except for the menu name that must be changed for each menu item. For example, the menu name Home (presented in bold in the following code) should be replaced with the word **Setup** for the Setup menu, **Select** for the Select menu, and so on. Go to Shared Components, select Authorization Schemes under the Security section, and click the Create button. Select the From Scratch option in the initial wizard screen and set the remaining attributes as indicated in Table 32-1.

Table 32-1. *Application Menu Authorization Scheme*

Attribute	Value
Name	Home
Scheme Type	PL/SQL Function Returning Boolean

PL/SQL Function Body
Book_Code\Chapter32\
Menu Authorization.txt
	DECLARE
	  Vadmin varchar2(1);
	  Vallow varchar2(1);
	BEGIN
	  SELECT admin INTO Vadmin FROM gl_users
	  WHERE upper(userid)=upper(:APP_USER);
	  IF Vadmin = 'N' then
	    SELECT allow_access INTO Vallow FROM
	    gl_groups_detail
	    WHERE segmentType='Menu' AND
	        segmentID=(select segmentID from
	            gl_segments
	            where segmentTitle='**Home (Menu)**' and
	            segmentType='Menu')
	            AND
	            groupID=(select groupID
	            from gl_users
	            where upper(userid)
	            =upper(:APP_USER));
	    if Vallow='Y' then
	  return true;
	    else
	  return false;
	    end if;
	  ELSE
	    return true;
	  END IF;
	EXCEPTION
	  WHEN NO_DATA_FOUND THEN RETURN FALSE;
	END;

Identify error message...	Home authorization scheme violated
Validate authorization scheme	Once per session

Create the remaining menu authorization schemes as listed in Table 32-2. Replace segmentTitle=**'Home (Menu)'** in the PL/SQL code with the corresponding menu name.

Table 32-2. *Menu Authorization Schemes*

Name	PL/SQL Code Text	Identify Error Message…
Setup	segmentTitle='Setup (Menu)'	Setup authorization scheme violated
Select	segmentTitle='Select (Menu)'	Select authorization scheme violated
Transactions	segmentTitle='Transactions (Menu)'	Transactions authorization scheme violated
Utilities	segmentTitle='Utilities (Menu)'	Utilities authorization scheme violated
Reports	segmentTitle='Reports (Menu)'	Reports authorization scheme violated
Closing	segmentTitle='Closing (Menu)'	Closing authorization scheme violated
Mobile	segmentTitle='Mobile (Menu)'	Mobile authorization scheme violated
Feedback	segmentTitle='Feedback (Menu)'	Feedback authorization scheme violated

After creating the menu authorization schemes, go to Shared Components and in the Navigation section select Navigation Menu ➤ Desktop Navigation Menu; then click the Home menu entry, select Home for the Authorization Scheme attribute, and click the Apply Changes button. This action will attach the Home authorization scheme to the Home menu. Repeat this step for the remaining menu options (as shown in Table 32-3) including the Mobile and Feedback entries in the desktop navigation bar.

Table 32-3. *Menu Items and Associated Authorization Schemes*

Menu Entry	Authorization Scheme
Home	Home
Setup	Setup
Select	Select
Transactions	Transactions
Utilities	Utilities
Reports	Reports
Closing	Closing
Mobile	Mobile
Feedback	Feedback

32.2 Test Menu Authorization

Test the menu authorization schemes you just implemented using the following steps. Make sure you have created the Clerks group (in Chapter 7) and the user John (in Chapter 8) who is assigned to this group. Recall that the Clerks group was created without any application access privileges.

1. Log in to the application using John's credentials and see that no application menu is available to this user.
2. Log in using the application's administrator credentials.
3. From the Setup menu, select the User Groups option and then select the existing Clerks group. Allow access to the Select, Transactions, Utilities, Reports, and Feedback menus for this group.
4. Log in again as user John and observe that the five menu options are now accessible.

32.3 Authorization Schemes for Application Pages

After controlling the main menu access, your next task is to control the application pages that are usually executed through submenus (except for the pages associated with the Select and Transactions menus). Go to Shared Components and create the authorization scheme listed in Table 32-4. This is the only authorization scheme that controls access to all application pages. The text defined in the "Identify error message" attribute is a custom message with a link to take the unauthorized user to the Select page (page 30), which is usually granted to every application user.

***Table 32-4.** Authorization Scheme for Application Pages*

Attribute	Value
Name	Page Access
Scheme Type	PL/SQL Function Returning Boolean
PL/SQL Function Body Book_Code\Chapter32\ Page Access Authorization.txt	
Identify error message...	You are not authorized to view this page!
 Click <a href="f?p=&APP_ID.:30:&SESSION.">here</ a> to continue.
Validate authorization scheme	Once per page view

```
DECLARE
  Vadmin varchar2(1);
  Vallow varchar2(1);
BEGIN
  SELECT admin INTO Vadmin FROM gl_users
  WHERE upper(userid)=upper(:APP_USER);
  IF Vadmin = 'N' THEN
    SELECT allow_access INTO Vallow FROM gl_
              groups_detail
    WHERE pageID=:APP_PAGE_ID AND
              segmentType='Page' AND
              groupID=(select groupID from gl_users
                         where upper(userid)=upper
                         (:APP_USER));
    if Vallow='Y' then
       return true;
    else
       return false;
    end if;
  ELSE
    return true;
  END IF;
EXCEPTION
  WHEN NO_DATA_FOUND THEN RETURN FALSE;
END;
```

32.4 Test Page Authorization

Execute the following steps to test the page authorization:

1. Edit page 54 (Copy COA). Click its root node (page 54: Copy COA). In the Properties pane, scroll down to the Security section and set the Authorization Scheme attribute to Page Access. Save the modification.
2. Log in to the application using John's credentials. Expand the Utilities menu and click the Copy Chart of Accounts option. The message defined in the previous table will appear and prevent you from accessing the page. Click the "here" link, which will take you to the Select page.
3. Log in as the application administrator and allow John's group to access the Copy COA segment.
4. Log in again using John's credentials and click the Copy COA menu option. This time the page will come up.
5. Using step 1, apply the Page Access authorization scheme to all application pages except for the two pairs of global and login pages created for the desktop and mobile interfaces.

32.5 Authorization Schemes for Buttons

An application page usually contains several different types of items. From a security point of view, the most significant item is the button, which is used to send a request for further processing. You used six buttons (Save, Create, Modify, Delete, Display, and Print) to handle different processes in this application. In this section, you will control the application processes by creating some authorization schemes for these buttons. Table 32-5 creates an authorization scheme to control the Save buttons on all application pages. Use this table to create schemes for the remaining five buttons, replacing the text *itemRole='Save'* with the appropriate button name.

Table 32-5. *Button Authorization Schemes*

Attribute	Value
Name	Save
Scheme Type	PL/SQL Function Returning Boolean

PL/SQL Function Body
Book_Code\Chapter32\
Button Authorization.txt
	DECLARE
	  Vadmin varchar2(1);
	  Vallow varchar2(1);
	BEGIN
	  SELECT admin INTO Vadmin FROM gl_users
	  WHERE upper(userid)=upper(:APP_USER);
	  IF Vadmin = 'N' THEN
	    SELECT allow_access INTO Vallow FROM
	            gl_groups_detail
	    WHERE pageID=:APP_PAGE_ID AND
	            itemRole='**Save**' AND
	            groupID=(select groupID from
	                      gl_users where
	                      upper(userid)=upper
	                      (:APP_USER));
	    if Vallow='Y' then
	      return true;
	    else
	      return false;
	    end if;
	 ELSE
	    return true;
	  END IF;
	EXCEPTION
	  WHEN NO_DATA_FOUND THEN RETURN FALSE;
	END;

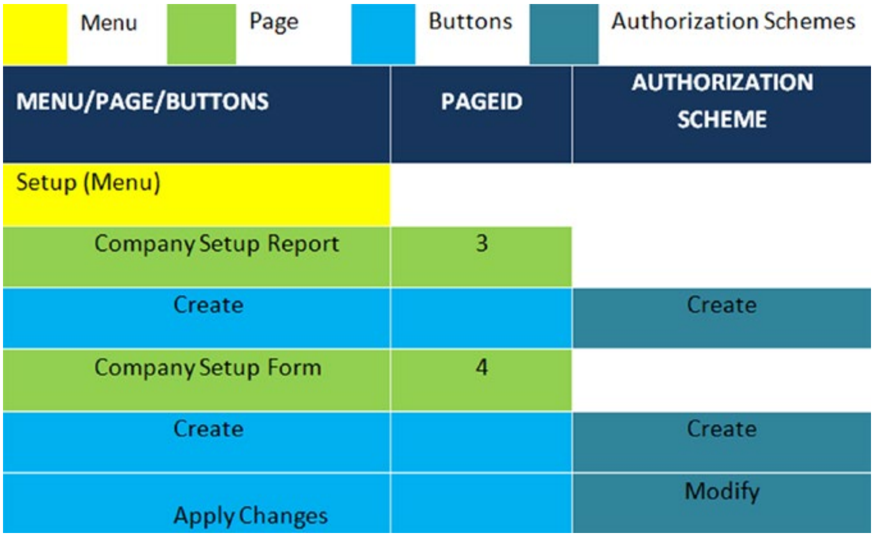
Identify error message...	Save button authorization scheme violated
Validate authorization scheme	Once per page view

32.6 Test Buttons Authorization

Execute the following steps to test the button authorization:

1. Edit page 54 (Copy COA). Click the Copy button. In the Properties pane, scroll down to the Security section and set the Authorization Scheme attribute to Save. Save the modification.
2. Log in using John's credentials and run the page from the Utilities menu. The button has vanished from the page, because John's group was created without any application access privileges.
3. Log in as the application administrator and grant access to this button to the Clerks group.
4. Log in as John. This time the Copy button on the Copy COA page will be visible.
5. Using Table 32-6, apply the relevant authorization schemes to all buttons on all application pages.

Table 32-6. *Applying Authorization Schemes*

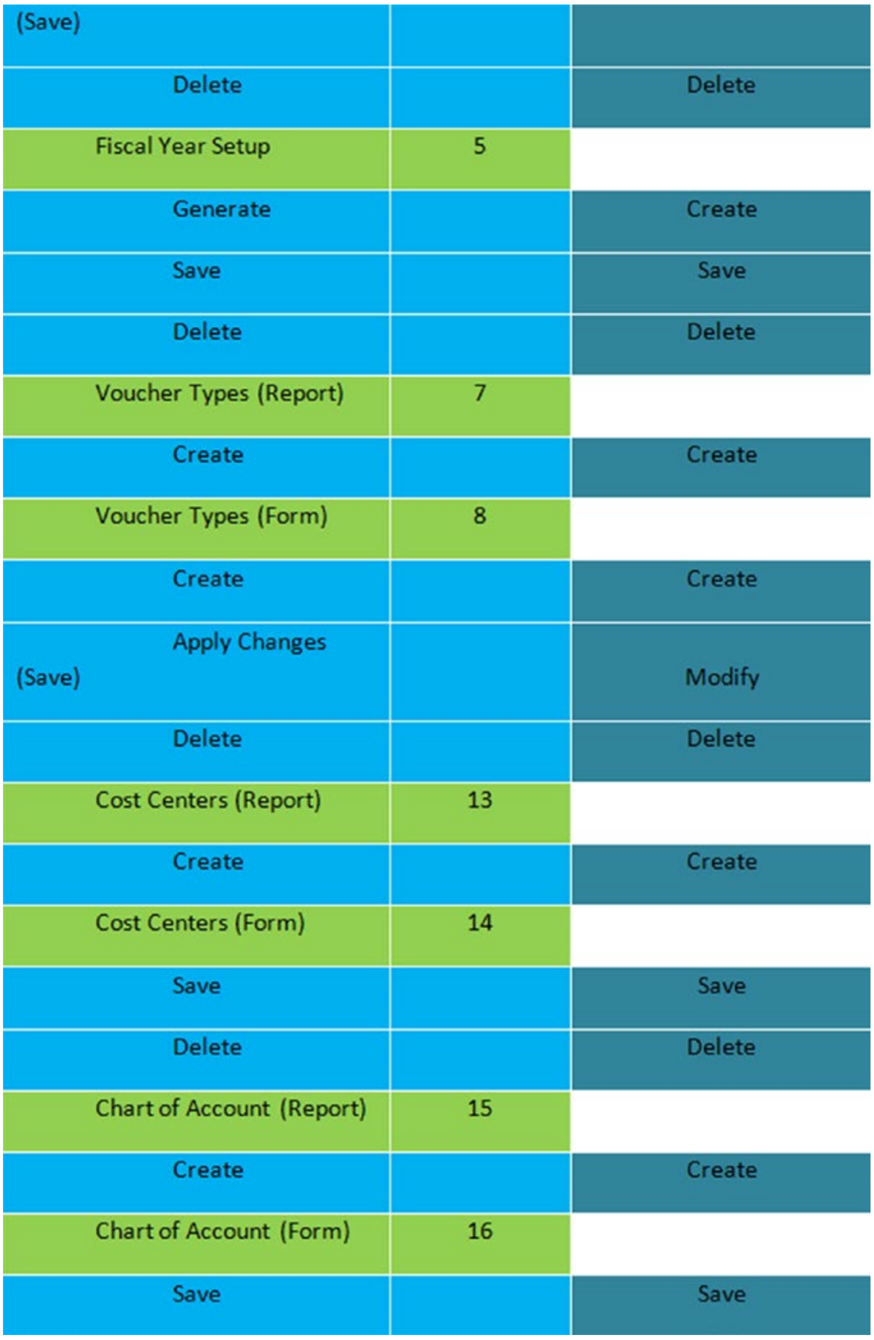


🟨	Menu	🟩	Page	🟦	Buttons	▨	Authorization Schemes

MENU/PAGE/BUTTONS	PAGEID	AUTHORIZATION SCHEME
Setup (Menu)		
Company Setup Report	3	
Create		Create
Company Setup Form	4	
Create		Create
Apply Changes		Modify

(*continued*)

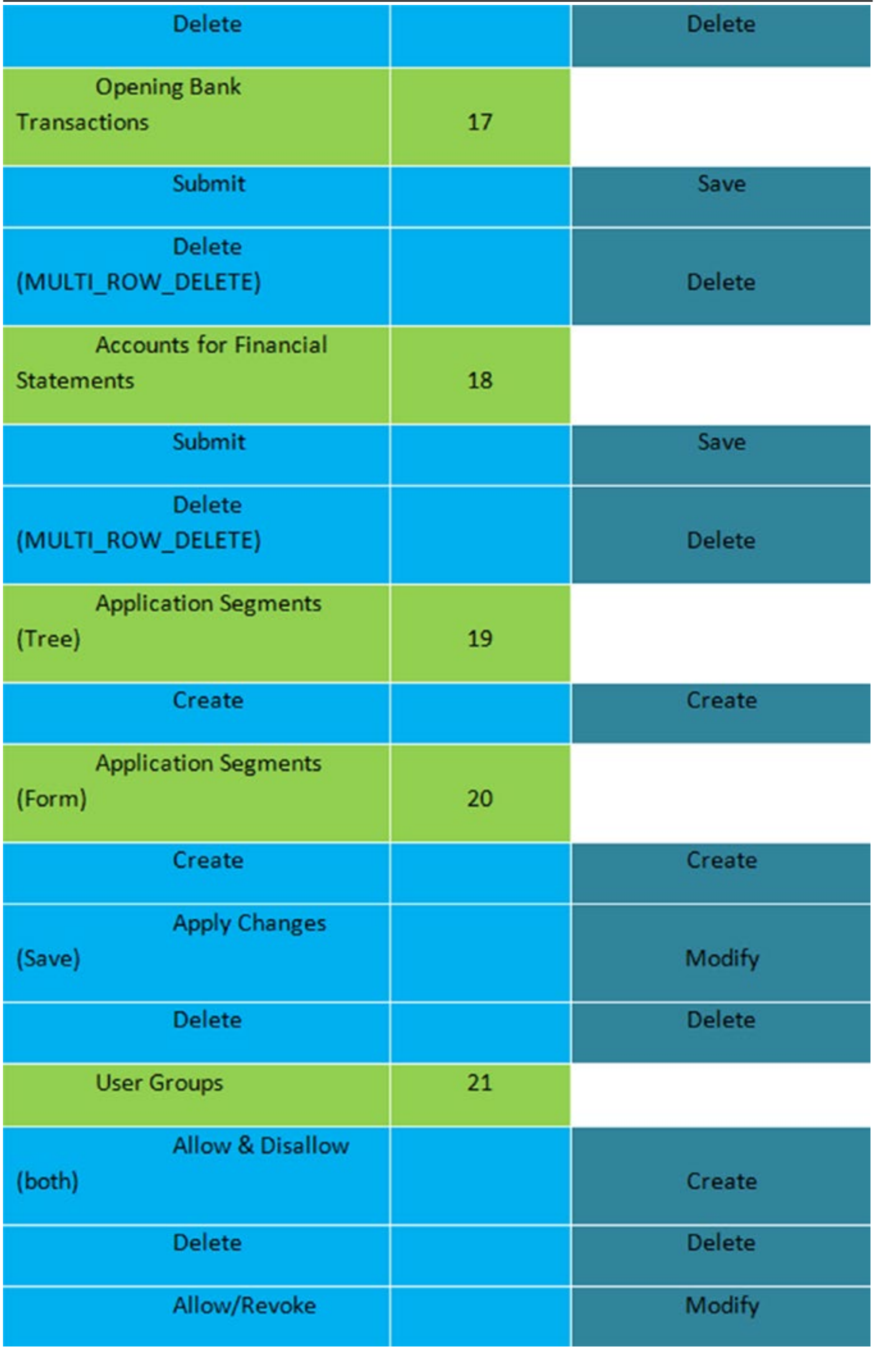
Table 32-6. *(continued)*



(Save)		
Delete		Delete
Fiscal Year Setup	5	
Generate		Create
Save		Save
Delete		Delete
Voucher Types (Report)	7	
Create		Create
Voucher Types (Form)	8	
Create		Create
Apply Changes (Save)		Modify
Delete		Delete
Cost Centers (Report)	13	
Create		Create
Cost Centers (Form)	14	
Save		Save
Delete		Delete
Chart of Account (Report)	15	
Create		Create
Chart of Account (Form)	16	
Save		Save

(continued)

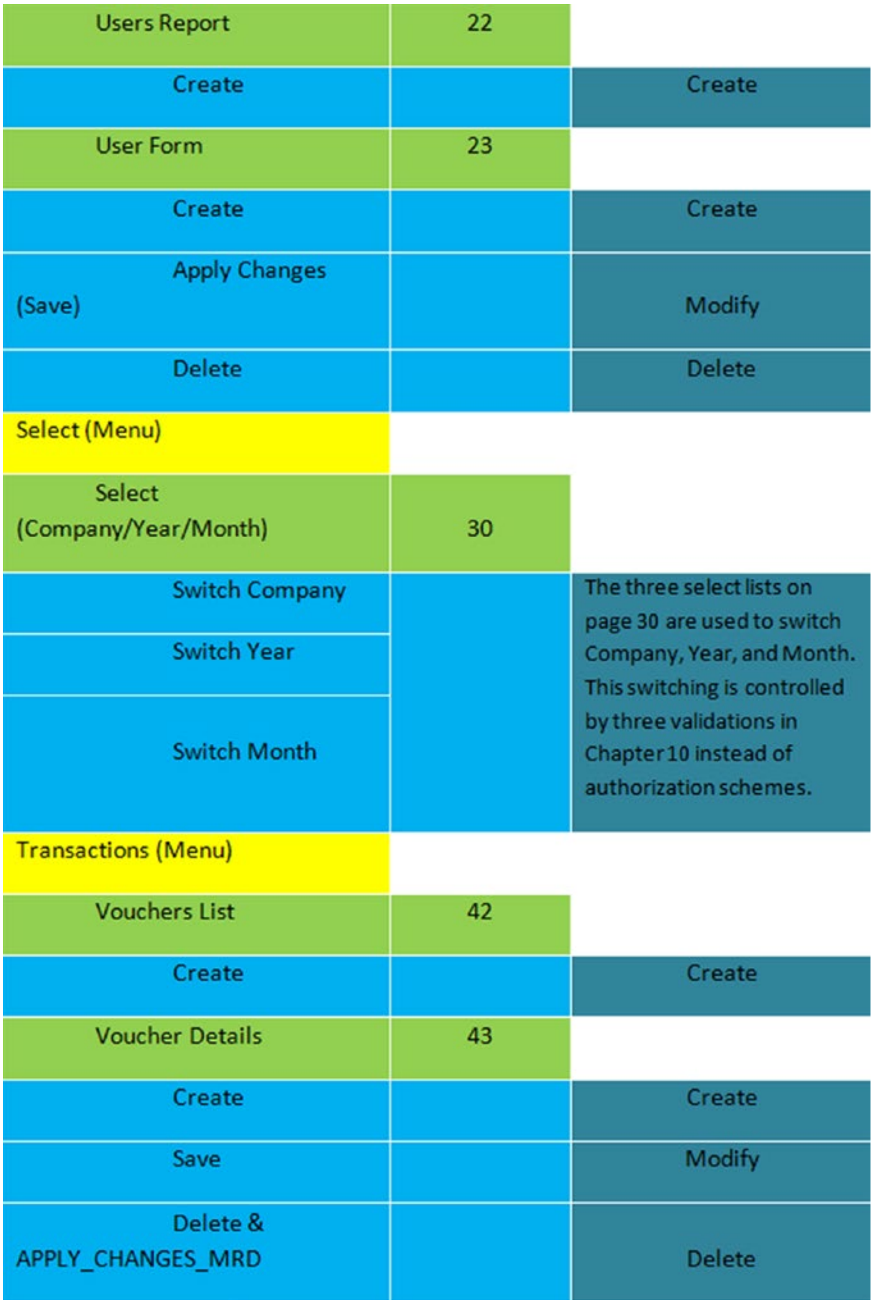
Table 32-6. (*continued*)



Delete		Delete
Opening Bank Transactions	17	
Submit		Save
Delete (MULTI_ROW_DELETE)		Delete
Accounts for Financial Statements	18	
Submit		Save
Delete (MULTI_ROW_DELETE)		Delete
Application Segments (Tree)	19	
Create		Create
Application Segments (Form)	20	
Create		Create
Apply Changes (Save)		Modify
Delete		Delete
User Groups	21	
Allow & Disallow (both)		Create
Delete		Delete
Allow/Revoke		Modify

(*continued*)

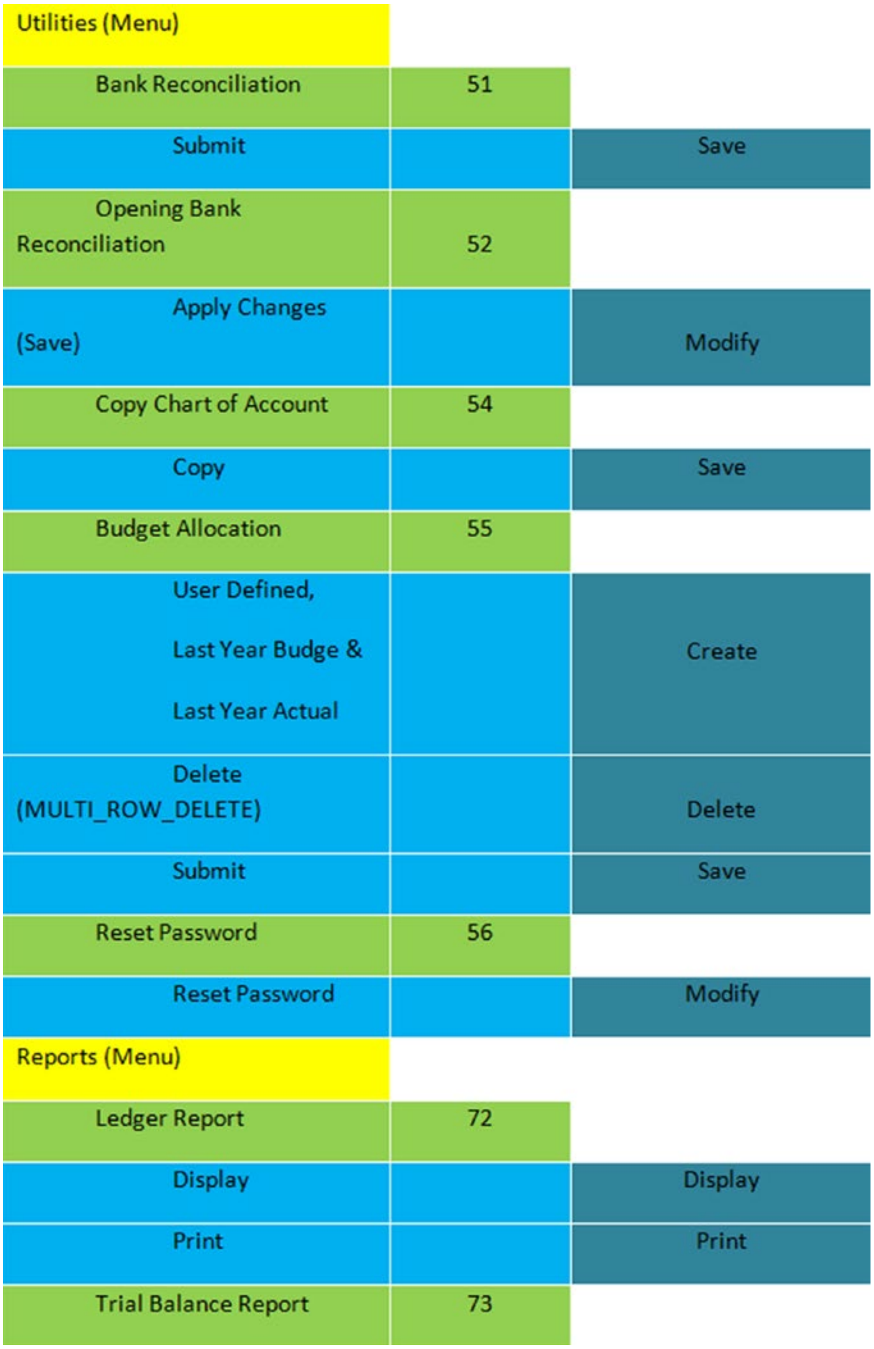
Table 32-6. (*continued*)



Users Report	22	
Create		Create
User Form	23	
Create		Create
Apply Changes (Save)		Modify
Delete		Delete
Select (Menu)		
Select (Company/Year/Month)	30	
Switch Company		The three select lists on page 30 are used to switch Company, Year, and Month. This switching is controlled by three validations in Chapter 10 instead of authorization schemes.
Switch Year		
Switch Month		
Transactions (Menu)		
Vouchers List	42	
Create		Create
Voucher Details	43	
Create		Create
Save		Modify
Delete & APPLY_CHANGES_MRD		Delete

(*continued*)

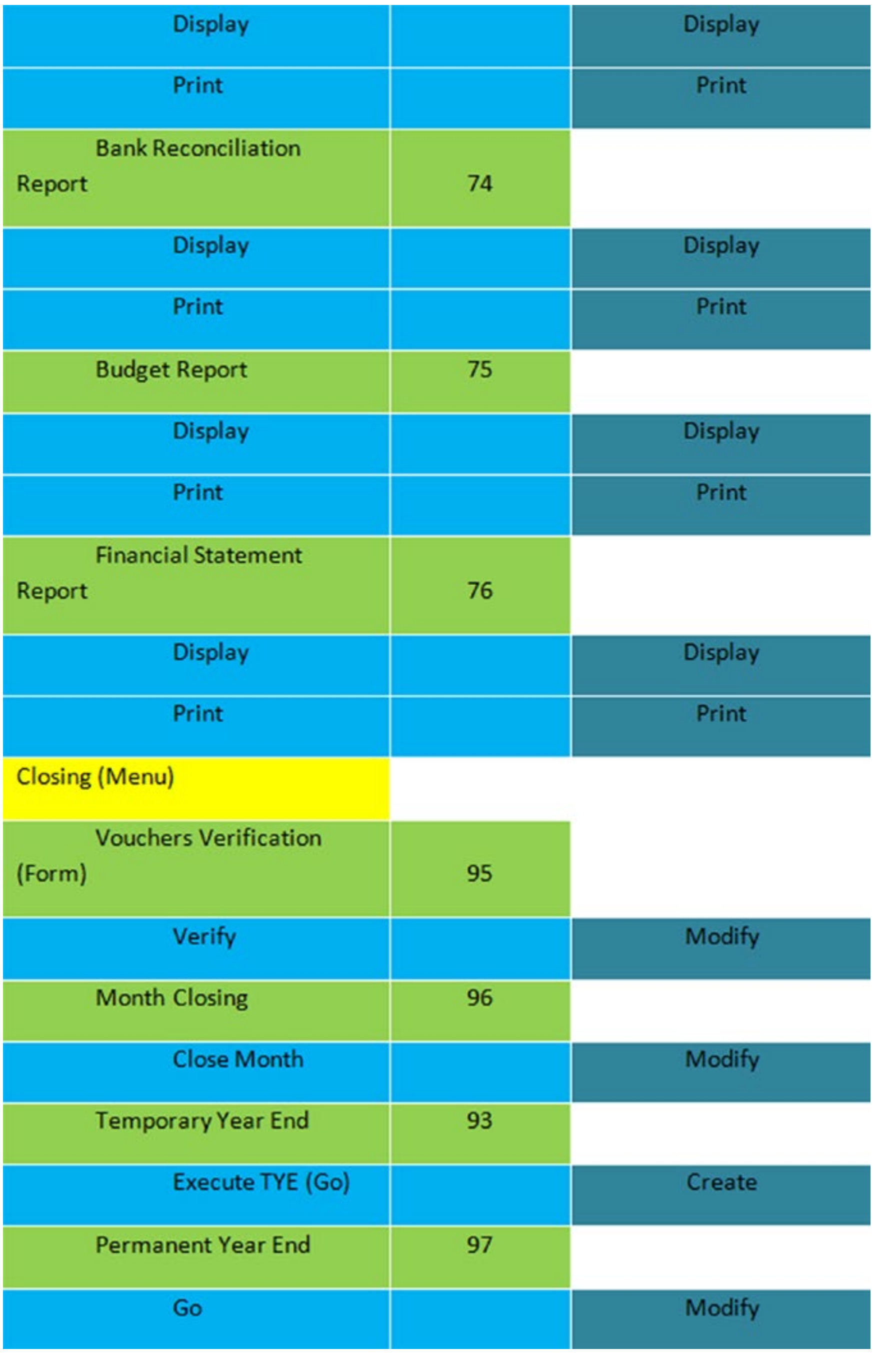
Table 32-6. (*continued*)



Utilities (Menu)		
Bank Reconciliation	51	
Submit		Save
Opening Bank Reconciliation	52	
Apply Changes (Save)		Modify
Copy Chart of Account	54	
Copy		Save
Budget Allocation	55	
User Defined, Last Year Budge & Last Year Actual		Create
Delete (MULTI_ROW_DELETE)		Delete
Submit		Save
Reset Password	56	
Reset Password		Modify
Reports (Menu)		
Ledger Report	72	
Display		Display
Print		Print
Trial Balance Report	73	

(*continued*)

Table 32-6. (*continued*)



Display		Display
Print		Print
Bank Reconciliation Report	74	
Display		Display
Print		Print
Budget Report	75	
Display		Display
Print		Print
Financial Statement Report	76	
Display		Display
Print		Print
Closing (Menu)		
Vouchers Verification (Form)	95	
Verify		Modify
Month Closing	96	
Close Month		Modify
Temporary Year End	93	
Execute TYE (Go)		Create
Permanent Year End	97	
Go		Modify

■ **Note** When applying security to a button, remember to also apply equal security constraints to the process that is invoked when the button is clicked. For example, the Authorization Scheme attribute of the Copy COA process on page 54 must be set to Save. This way, the process is also attached to the authorized scheme that matches the button to avoid access-control vulnerability.

32.7 Summary

In this chapter, you learned how to apply strong security on each component of your APEX application. Either through an application page or a button on that page, you can control user access to all application components.

32.8 Conclusion

The main objective behind this book was to give you insight into developing business applications for the cloud. You can develop such applications and offer them to the business community under the software as a service model. Now, why should you use Oracle APEX for this? It's simply because Oracle APEX is a rising platform in which you can develop Internet-facing applications rapidly, as you have just experienced. Besides being a rapid application development tool, Oracle APEX offers many features that are lacking in other web development platforms. The new IDE has made the process of application development much easier than ever before. The strong navigation features found in APEX cannot be created that easily in any other development tool. Using the shared components, you can use application components and logic in more than one place. Eye-catching charts and mobile application development are among many other features offered by this platform for rapid application development, but the most important one is the use of less code that is required when you are implementing custom application logic. In addition, everything can easily be handled through the built-in features. In a nutshell, Oracle APEX has made the life of developers significantly easier. With this development platform, you can create any kind of business application instantly to meet the challenges of today's ever-evolving business world.

I have tried my best to make this an error-free book, but flaws might still exist for which I sincerely apologize. Please let me know of any errors at my e-mail address (`oratech@cyber.net.pk`) so that I can post corrections on my blog page: `http://cloudcomputingusingoracleapex.blogspot.com/2015/03/errata.html`.

The last word: I have plans to write more books like this on other ERP modules. If you liked this work and want me to go ahead with my plans, then drop me a line at my e-mail address indicating your area of interest. I'll write the next APEX book on the subject with the most votes.

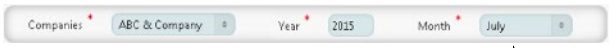
Thank you!

APPENDIX

Book Code

Chapter 4

Generate Fiscal Year



```
declare
   Vyear number;
   VleapYear number;
begin
   Vyear := :P5_YEAR;
   if :P5_MONTH = 7 then
      :P5_MONTH1 := 'July';
      :P5_FROM1 := '01-07-'||Vyear;    -- Stores 01-07-2015 in the page item
                                          :P5_FROM1
      :P5_TO1 := '31-07-'||Vyear;      -- Stores 31-07-2015 in the page item
                                          :P5_TO1
--    'August'
      :P5_MONTH2 := 'August';
      :P5_FROM2 := '01-08-'||Vyear;
      :P5_TO2 := '31-08-'||Vyear;
--    'September'
      :P5_MONTH3 := 'September';
      :P5_FROM3 := '01-09-'||Vyear;
      :P5_TO3 := '30-09-'||Vyear;
--    'October'
      :P5_MONTH4 := 'October';
      :P5_FROM4 := '01-10-'||Vyear;
      :P5_TO4 := '31-10-'||Vyear;
--    'November'
      :P5_MONTH5 := 'November';
      :P5_FROM5 := '01-11-'||Vyear;
      :P5_TO5 := '30-11-'||Vyear;
--    'December'
      :P5_MONTH6 := 'December';
      :P5_FROM6 := '01-12-'||Vyear;
```

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```
      :P5_TO6 := '31-12-'||Vyear;
      Vyear := Vyear+1;                      -- Incremented the Vyear value
                                                to set the next year in
                                                January
--    'January'
      :P5_MONTH7 := 'January';
      :P5_FROM7 := '01-01-'||Vyear;
      :P5_TO7 := '31-01-'||Vyear;
--    'February'
      :P5_MONTH8 := 'February';
      :P5_FROM8 := '01-02-'||Vyear;
      VleapYear := mod(Vyear,4);             -- Evaluate leap year
      if VleapYear=0 then
         :P5_TO8 := '29-02-'||Vyear;
      else
         :P5_TO8 := '28-02-'||Vyear;
      end if;
--    'March'
      :P5_MONTH9 := 'March';
      :P5_FROM9 := '01-03-'||Vyear;
      :P5_TO9 := '31-03-'||Vyear;
--    'April'
      :P5_MONTH10 := 'April';
      :P5_FROM10 := '01-04-'||Vyear;
      :P5_TO10 := '30-04-'||Vyear;

--    'May'
      :P5_MONTH11 := 'May';
      :P5_FROM11 := '01-05-'||Vyear;
      :P5_TO11 := '31-05-'||Vyear;
--    'June'
      :P5_MONTH12 := 'June';
      :P5_FROM12 := '01-06-'||Vyear;
      :P5_TO12 := '30-06-'||Vyear;
   end if;
end;
```

Save Fiscal Year

```
BEGIN
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,1,:P5_MONTH1,
                                       TO_DATE(:P5_FROM1,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO1,'DD-MM-YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,2,:P5_MONTH2,
                                       TO_DATE(:P5_FROM2,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO2,'DD-MM-YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,3,:P5_MONTH3,
                                       TO_DATE(:P5_FROM3,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO3,'DD-MM-YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,4,:P5_MONTH4,
                                       TO_DATE(:P5_FROM4,'DD-MM-
                                       YYYY'),TO_DATE(:P5_TO4,'DD-MM-
                                       YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,5,:P5_MONTH5,
                                       TO_DATE(:P5_FROM5,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO5,'DD-MM-YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,6,:P5_MONTH6,
                                       TO_DATE(:P5_FROM6,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO6,'DD-MM-YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,7,:P5_MONTH7,
                                       TO_DATE(:P5_FROM7,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO7,'DD-MM-YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,8,:P5_MONTH8,
                                       TO_DATE(:P5_FROM8,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO8,'DD-MM-YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,9,:P5_MONTH9,
                                       TO_DATE(:P5_FROM9,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO9,'DD-MM-YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,10,:P5_MONTH10,
                                       TO_DATE(:P5_FROM10,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO10,'DD-MM-YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,11,:P5_MONTH11,
                                       TO_DATE(:P5_FROM11,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO11,'DD-MM-YYYY'),1,0,0,null);
   insert into gl_fiscal_year values (:P5_COMPANIES,:P5_YEAR,12,:P5_MONTH12,
                                       TO_DATE(:P5_FROM12,'DD-MM-YYYY'),TO_
                                       DATE(:P5_TO12,'DD-MM-YYYY'),1,0,0,null);
END;
```

Fetch Fiscal Year

The cursor fetches the initial fiscal year records of the selected company.

```
DECLARE
   Vrecords number;
   CURSOR fiscal_year_cur IS SELECT *
   FROM gl_fiscal_year
   WHERE cocode = :P5_COMPANIES and initial_year=1 ORDER BY comonthid;
   fiscal_year_rec fiscal_year_cur%ROWTYPE;
BEGIN
   select count(*) into Vrecords from gl_fiscal_year where cocode=:P5_
   COMPANIES and initial_year=1;
   if Vrecords > 0 then  -- The page items will be populated with values
                             only when there exist some records
      FOR fiscal_year_rec IN fiscal_year_cur LOOP  -- Cursor opened to fetch
                                                       records
```

```
        if fiscal_year_rec.comonthid=1 then
           :P5_YEAR := fiscal_year_rec.coyear;
           :P5_MONTH := fiscal_year_rec.comonthname;
           :P5_INITIAL_YEAR := fiscal_year_rec.initial_year;
           :P5_MONTH1 := fiscal_year_rec.comonthname;
           :P5_FROM1 := fiscal_year_rec.pfrom;
           :P5_TO1 := fiscal_year_rec.pto;
        end if;
        if fiscal_year_rec.comonthid=2 then
           :P5_MONTH2 := fiscal_year_rec.comonthname;
           :P5_FROM2 := fiscal_year_rec.pfrom;
           :P5_TO2 := fiscal_year_rec.pto;
        end if;
        if fiscal_year_rec.comonthid=3 then
           :P5_MONTH3 := fiscal_year_rec.comonthname;
           :P5_FROM3 := fiscal_year_rec.pfrom;
           :P5_TO3 := fiscal_year_rec.pto;
        end if;
        if fiscal_year_rec.comonthid=4 then
           :P5_MONTH4 := fiscal_year_rec.comonthname;
           :P5_FROM4 := fiscal_year_rec.pfrom;
           :P5_TO4 := fiscal_year_rec.pto;
        end if;
        if fiscal_year_rec.comonthid=5 then
           :P5_MONTH5 := fiscal_year_rec.comonthname;
           :P5_FROM5 := fiscal_year_rec.pfrom;
           :P5_TO5 := fiscal_year_rec.pto;
        end if;
        if fiscal_year_rec.comonthid=6 then
           :P5_MONTH6 := fiscal_year_rec.comonthname;
           :P5_FROM6 := fiscal_year_rec.pfrom;
           :P5_TO6 := fiscal_year_rec.pto;
        end if;
        if fiscal_year_rec.comonthid=7 then
           :P5_MONTH7 := fiscal_year_rec.comonthname;
           :P5_FROM7 := fiscal_year_rec.pfrom;
           :P5_TO7 := fiscal_year_rec.pto;
        end if;
        if fiscal_year_rec.comonthid=8 then
           :P5_MONTH8 := fiscal_year_rec.comonthname;
           :P5_FROM8 := fiscal_year_rec.pfrom;
           :P5_TO8 := fiscal_year_rec.pto;
        end if;
        if fiscal_year_rec.comonthid=9 then
           :P5_MONTH9 := fiscal_year_rec.comonthname;
           :P5_FROM9 := fiscal_year_rec.pfrom;
           :P5_TO9 := fiscal_year_rec.pto;
        end if;
        if fiscal_year_rec.comonthid=10 then
           :P5_MONTH10 := fiscal_year_rec.comonthname;
           :P5_FROM10 := fiscal_year_rec.pfrom;
           :P5_TO10 := fiscal_year_rec.pto;
        end if;
        if fiscal_year_rec.comonthid=11 then
           :P5_MONTH11 := fiscal_year_rec.comonthname;
           :P5_FROM11 := fiscal_year_rec.pfrom;
           :P5_TO11 := fiscal_year_rec.pto;
        end if;

        if fiscal_year_rec.comonthid=12 then
           :P5_MONTH12 := fiscal_year_rec.comonthname;
           :P5_FROM12 := fiscal_year_rec.pfrom;
           :P5_TO12 := fiscal_year_rec.pto;
        end if;
     END LOOP;
  else            -- The fiscal year of the selected company doesn't exist,
                     so make all page items as null
     :P5_YEAR := NULL;
     :P5_INITIAL_YEAR := NULL;
     :P5_MONTH := NULL;
     :P5_MONTH1 := NULL;
     :P5_FROM1 := NULL;
     :P5_TO1 := NULL;
     :P5_MONTH2 := NULL;
     :P5_FROM2 := NULL;
     :P5_TO2 := NULL;
     :P5_MONTH3 := NULL;
     :P5_FROM3 := NULL;
     :P5_TO3 := NULL;
     :P5_MONTH4 := NULL;
     :P5_FROM4 := NULL;
     :P5_TO4 := NULL;
     :P5_MONTH5 := NULL;
     :P5_FROM5 := NULL;
     :P5_TO5 := NULL;
     :P5_MONTH6 := NULL;
     :P5_FROM6 := NULL;
     :P5_TO6 := NULL;
     :P5_MONTH7 := NULL;
     :P5_FROM7 := NULL;
     :P5_TO7 := NULL;
     :P5_MONTH8 := NULL;
     :P5_FROM8 := NULL;
     :P5_TO8 := NULL;
     :P5_MONTH9 := NULL;
     :P5_FROM9 := NULL;
```

```
      :P5_TO9 := NULL;
      :P5_MONTH10 := NULL;
      :P5_FROM10 := NULL;
      :P5_TO10 := NULL;
      :P5_MONTH11 := NULL;
      :P5_FROM11 := NULL;
      :P5_TO11 := NULL;
      :P5_MONTH12 := NULL;
      :P5_FROM12 := NULL;
      :P5_TO12 := NULL;
   end if;
END;
```

Page Items to Return

```
P5_YEAR,P5_MONTH,P5_INITIAL_YEAR,P5_MONTH1,P5_FROM1,P5_TO1,P5_MONTH2,
P5_FROM2,P5_TO2,P5_MONTH3,
P5_FROM3,P5_TO3,P5_MONTH4,P5_FROM4,P5_TO4,P5_MONTH5,P5_FROM5,P5_TO5,
P5_MONTH6,P5_FROM6,P5_TO6,
P5_MONTH7,P5_FROM7,P5_TO7,P5_MONTH8,P5_FROM8,P5_TO8,P5_MONTH9,P5_FROM9,
P5_TO9,P5_MONTH10,
P5_FROM10,P5_TO10,P5_MONTH11,P5_FROM11,P5_TO11,P5_MONTH12,P5_FROM12,P5_TO12
```

Check Transaction

```
declare
  l_count number;
begin
   select count(*) into l_count from gl_tran_master where cocode = :P5_
   COMPANIES;
   if l_count > 0 then
      return false;          -- Displays the message: Can't delete,
                                transactions exist in this year
   else
      return true;
   end if;
end;
```

The PL/SQL code stores the number of transactions of the selected company in the l_count variable. A value greater than zero in this variable means the existence of transactions. In such case, the code returns false to prevent fiscal year deletion.

Chapter 5

Check Transaction

```
DECLARE
  l_count number;
BEGIN
   select count(*) into l_count from gl_tran_master where vchcode = :P8_
   VCHCODE;
   if l_count > 0 then
      return false;
   else
      return true;
   end if;
END;
```

Chapter 6

Tree Query

```
select case when connect_by_isleaf = 1 then 0 when level = 1 then 1 else -1
end as status,
            level,
            segmenttitle as title,
            NULL  as icon,
            segmentid as value,
            'View' as tooltip,
            apex_util.prepare_url('f?p='||:APP_ID||':20:'||:APP_
SESSION||'::NO::P20_SEGMENTID:'||segmentid) as link
from   gl_segments
start with segmentparent = 0
connect by prior segmentid = segmentparent
order siblings by segmentid
```

Check Segment

```
DECLARE
   Vutilized number := 0;
   Verrortext varchar2(60);
BEGIN
   select count(*) into Vutilized from gl_groups_detail where
   segmentId=:P20_SEGMENTID;
   if Vutilized > 0 then
      Verrortext := 'Cannot delete this segment because it is utilized';
   end if;
   return rtrim(Verrortext);
END;
```

Check Child Segment

```
DECLARE
   VchildExist number := 0;
   Verrortext varchar2(60);
BEGIN
   select count(*) into VchildExist from gl_segments where
   segmentParent=:P20_SEGMENTID;
   if VchildExist > 0 then
      Verrortext := 'Cannot delete, this segment has child entries';
   end if;
   return rtrim(Verrortext);
END;
```

Chapter 7

Create New Group

```
DECLARE
   VsegmentID number := 0;
   VsegmentParent Number;
   VsegmentType varchar2(4);
   VpageID number := 0;
   VitemRole varchar2(10);
   Vallow varchar2(1);
   VmasterRow number := 0;

   cursor segments_cur is
   select *
   from gl_segments
   order by segmentID;
   segments_rec segments_cur%ROWTYPE;

BEGIN
   if :request='Allow' then    -- The request came from the Allow button
                                  labeled Create Group - Allow All
      Vallow := 'Y';
   else
      Vallow := 'N';
   end if;

   for segments_rec in segments_cur loop
      VsegmentID := segments_rec.segmentID;
      VsegmentParent := segments_rec.segmentParent;
      VsegmentType := segments_rec.segmentType;
      VpageID := segments_rec.pageID;
      VitemRole := segments_rec.itemRole;
      if VmasterRow = 0 then
         insert into gl_groups_master values
         (:P21_GROUPID2,:P21_GROUPTITLE2);
         commit;
         VmasterRow := 1;  -- Master row switch turned off
      end if;
      insert into gl_groups_detail values
      (:P21_GROUPID2,VsegmentID,VsegmentParent,VsegmentType,VpageID,VitemRo
      le,Vallow);
      commit;
   end loop;
END;
```

If the group is created using the Allow button, then Y (for Yes) will be saved in the database table. On the contrary, if the request is sent through the Disallow button, N (for No) will be saved.

Tree Query

```
select case when connect_by_isleaf = 1 then 0 when level = 1 then 1 else -1
end as status,
            level,
            segmenttitle as title,
            NULL  as icon,
            segmentid as value,
            'View Right' as tooltip,
            'javascript:pageItemName('||apex_escape.js_
            literal(segmentid)||')' as link
from   gl_segments
start with segmentparent = 0
connect by prior segmentid = segmentparent
order siblings by segmentid
```

Allow Access

```
DECLARE
   VrecordExist number := 0;
   Vallow varchar2(1);
   Vsegmenttype varchar2(4);
   Vpageid number;
   Vitemrole varchar2(10);
BEGIN
   select count(*) into VrecordExist from gl_groups_detail
   where groupID=:P21_GROUPID1 and segmentID=:P21_SELECTED_NODE;
   if VrecordExist = 1 then
      select allow_access into Vallow from gl_groups_detail
      where groupID=:P21_GROUPID1 and segmentID=:P21_SELECTED_NODE;
      if Vallow='Y' then  -- If the group is currently allowed to access
                             this segment, then
         Vallow := 'N';  --  revoke it
      else                -- If currently the segment is not allowed, then
         Vallow := 'Y';   -- allow it
      end if;
      update gl_groups_detail
      set allow_access=Vallow
      where groupID=:P21_GROUPID1 and segmentID=:
P21_SELECTED_NODE;
      commit;
   else
      select segmenttype,pageid,itemrole into Vsegmenttype,Vpageid,Vitemrole
      from gl_segments
      where segmentID=:P21_SELECTED_NODE;
      insert into gl_groups_detail values (:P21_GROUPID1,:P21_SELECTED_NODE,
      null,Vsegmenttype,VpageID,Vitemrole,'N');
      commit;
   end if;
END;
```

It's a new segment that is added to the application after the group creation. The ELSE block will add such segments to the group with disallowed privilege.

Chapter 8

SQL Query

```
select "U"."ROWID",
            "U"."USERID",
            "G"."GROUPTITLE",
            "C"."CONAME",
            "U"."COYEAR",
            "F"."COMONTHNAME",
            "U"."PASSWORD",
            "U"."ADMIN"
from  "GL_USERS" "U", "GL_GROUPS_MASTER" "G", "GL_COMPANY" "C", "GL_FISCAL_
YEAR" "F"
where "U"."COCODE"="C"."COCODE" and "U"."GROUPID"="G"."GROUPID" and
"U"."COCODE"="F"."COCODE" and
             "U"."COYEAR"="F"."COYEAR" and "U"."COMONTHID"="F"."COMONTHID"
```

Company Year Month

```
DECLARE
   Vcoyear number;
BEGIN
   select max(coyear) into Vcoyear from gl_fiscal_year where cocode=:P23_
   COMPANY;
   update gl_users set cocode=:P23_COMPANY,coyear=Vcoyear,comonthID=1 where
   userid=:P23_USERID;
   commit;
END;
```

Chapter 9

Custom Functions

This function should be wrapped, as the hash algorithm is exposed here. See my blog post "Protecting Your Code with Oracle's Wrap Utility":
    http://oracleapex5.blogspot.com/2015/05/protecting-your-code-with-oracles-wrap.html

```
-- CUSTOM HASH FUNCTION
create or replace function custom_hash (p_userName in varchar2, p_password
in varchar2) return varchar2 is
   l_password varchar2(4000);
   l_salt varchar2(4000) := 'XV1MH24EC1IHDCQHSS6XQ6QTJSANT3';
begin
```

```
   l_password := utl_raw.cast_to_raw(dbms_obfuscation_toolkit.md5(input_
   string => p_password || substr(l_salt,10,13) ||
   p_userName || substr(l_salt, 4,10)));
   return l_password;
end;
```

The CUSTOM_AUTH function receives username and password on line # 1 as parameters from the login form and compares this information with the values stored in the GL_USERS table after applying the CUSTOM_HASH function. If the provided information matches with the table values, the user is authenticated and is allowed to access the application.

```
-- CUSTOM AUTH FUNCTION
create or replace function custom_auth (p_userName in VARCHAR2, p_password
in VARCHAR2) return BOOLEAN is
   l_password varchar2(4000);
   l_stored_password varchar2(4000);
   l_count number;
begin
   select count(*) into l_count from gl_users where userID = p_userName;
   if l_count > 0 then
      select password into l_stored_password from gl_users where userID =
      p_userName;
      l_password := custom_hash(p_userName, p_password);
      if l_password = l_stored_password then
         return true;
      else
         return false;
      end if;
   else
      return false;
   end if;
end;
```

Check User ID

```
DECLARE
   Verrortext varchar2(100);
BEGIN
   if :P56_USERID is null and :P56_USERID2 is null THEN
      Verrortext := 'No user selected for the reset password process';
   end if;
   return rtrim(Verrortext);
END;
```

Match Passwords

```
BEGIN
   if :P56_PASSWORD1 = :P56_PASSWORD2 then
      return true;
   else
      return false;
   end if;
END;
```

Update Password

```
BEGIN
   if :P56_USERID is not null then
      update gl_users set password = custom_hash(:P56_USERID, :P56_
      PASSWORD1)
      where upper(userID) = upper(:P56_USERID);
   else
      update gl_users set password = custom_hash(:P56_USERID2, :P56_
      PASSWORD1)
      where upper(userID) = upper(:P56_USERID2);
   end if;
   commit;
END;
```

Chapter 10

Switch Company

```
DECLARE
   Vadmin varchar2(1);
   Vallow varchar2(1);
   VcurrentCompany number;
   Verrortext varchar2(60);
BEGIN
   select admin into Vadmin from gl_users where upper(userid)=upper(:APP_
USER);
   if Vadmin = 'N' then
      select allow_access into Vallow from gl_groups_detail
      where segmentID=(select segmentID from gl_segments where
      segmentTitle='Switch Company' and
                  segmentType='Item') and groupID=(select groupID from gl_
                  users where upper(userid)=upper(:APP_USER));
      if Vallow='N' then
         select cocode into VcurrentCompany from gl_users where
         upper(userid)=upper(:APP_USER);
         if :P30_COMPANY <> VcurrentCompany then
            Verrortext := 'You are not allowed to switch company';
         end if;
      end if;
   end if;
   return rtrim(Verrortext);
END;
```

Switch Year

```
DECLARE
   Vadmin varchar2(1);
   Vallow varchar2(1);
   VcurrentYear number;
   Verrortext varchar2(60);
BEGIN
```

```
   select admin into Vadmin from gl_users where upper(userid)=upper
   (:APP_USER);
   if Vadmin = 'N' then
      select allow_access into Vallow from gl_groups_detail
      where segmentID=(select segmentID from gl_segments where
      segmentTitle='Switch Year' and
                  segmentType='Item') and groupID=(select groupID from
                  gl_users where upper(userid)=upper(:APP_USER));
      if Vallow='N' then
         select coyear into VcurrentYear from gl_users where
         upper(userid)=upper(:APP_USER);
         if :P30_YEAR <> VcurrentYear then
            Verrortext := 'You are not allowed to switch year';
         end if;
      end if;
   end if;
   return rtrim(Verrortext);
END;
```

Switch Month

```
DECLARE
   Vadmin varchar2(1);
   Vallow varchar2(1);
   VcurrentMonth number;
   Verrortext varchar2(60);
BEGIN
   select admin into Vadmin from gl_users where upper(userid)=upper
   (:APP_USER);
   if Vadmin = 'N' then
      select  allow_access into Vallow from gl_groups_detail
      where segmentID=(select segmentID from gl_segments where
      segmentTitle='Switch Month' and
```

```
                  segmentType='Item') and groupID=(select groupID from gl_
                  users where upper(userid)=upper(:APP_USER));
      if Vallow='N' then
         select comonthid into VcurrentMonth from gl_users where
         upper(userid)=upper(:APP_USER);
         if :P30_MONTH <> VcurrentMonth then
            Verrortext := 'You are not allowed to switch month';
         end if;
      end if;
   end if;
   return rtrim(Verrortext);
END;
```

User Profile

```
DECLARE
   Vconame varchar2(50);
   vcoyear number;
   vcomonthname varchar2(9);
   Vuserprofile varchar2(100);
BEGIN
   select   distinct c.coname,f.comonthname,u.coyear into
   vconame,vcomonthname,vcoyear
   from     gl_company c, gl_users u, gl_fiscal_year f
   where  c.cocode=u.cocode and c.cocode=f.cocode and f.comonthid=u.
   comonthid and
                 upper(u.userid)=upper(:APP_USER);
   Vuserprofile := trim(Vconame)||' '||trim(Vcomonthname)||', '||Vcoyear;
   return Vuserprofile;
END;
```

Chapter 11

Evaluate Level

```
if length(:P14_CCCODE) = 2 then
   :P14_CCLEVEL := 1;
elsif length(:P14_CCCODE) = 5 then
   :P14_CCLEVEL := 2;
else
   :P14_CCLEVEL := 0;
end if;
```

Check Parent Level

```
DECLARE
   VparentFound number := 0;
   VparentCode varchar2(2);
BEGIN
   if :P14_CCLEVEL = 2 then
      VparentCode := substr(:P14_CCcode,1,2);
      select count(*) into VparentFound from gl_cost_center where
      CCcode=trim(VparentCode) and CClevel=1 and
      cocode=(select cocode from gl_users where upper(userid)=upper
      (:APP_USER));
      if VparentFound = 0 then
         return false;
      else
         return true;
      end if;
   end if;
END;
```

Check Child Level

```
DECLARE
   VchildFound number :=  0;
BEGIN
   select count(*) into VchildFound from gl_cost_center where CCcode like
    :P14_CCcode||'%' and CClevel > :P14_CClevel
   and cocode=(select cocode from gl_users where upper(userid)=upper
   (:app_user));
   if VchildFound > 0 then
      return false;
   else
      return true;
   end if;
END;
```

Check in Transaction

```
DECLARE
   Vdependent number :=  0;
BEGIN
   select count(*) into Vdependent from gl_tran_detail where CCcode =
   :P14_CCcode and
   cocode = (select cocode from gl_users where upper(userid) = upper
   (:app_user));
   if Vdependent > 0 then
      return false;
   else
      return true;
   end if;
END;
```

Disallow Code Modification

```
DECLARE
   Vdbcccode varchar2(5);
BEGIN
   select cccode into Vdbcccode from gl_cost_center where ROWID=:P14_ROWID;
   if :P14_CCcode <> Vdbcccode then
      return false;
   else
      return true;
   end if;
END;
```

Save Record

```
DECLARE
   Vcocode number;
BEGIN
   select cocode into Vcocode from gl_users where upper(userid)=upper(:APP_
   USER);
   if :P14_ROWID is null then    -- New Record
      insert into gl_cost_center values (Vcocode,:P14_CCcode,:P14_
      CCtitle,:P14_CClevel);
   else
      update gl_cost_center set CCtitle=:P14_CCtitle where ROWID=:P14_ROWID;
   end if;
END;
```

Chapter 12

Evaluate Level

```
if length(:P16_COACODE) = 1 then
   :P16_COALEVEL := 1;
elsif length(:P16_COACODE) = 3 then
   :P16_COALEVEL := 2;
elsif length(:P16_COACODE) = 6 then
   :P16_COALEVEL := 3;
elsif length(:P16_COACODE) = 11 then
   :P16_COALEVEL := 4;
else
   :P16_COALEVEL := 0;
end if;
```

Evaluate Nature

```
if :P16_COALEVEL = 2 or :P16_COALEVEL = 3 or :P16_COALEVEL = 4 then
   select coanature into :P16_NATURE_DISPLAY from gl_coa where
   coacode=substr(:P16_COACODE,1,1) and coalevel=1 and
   cocode=(select cocode from gl_users where upper(userid) = upper
   (:app_user));
end if;
```

The nature for level 2, 3, and 4 accounts is evaluated using the first level. For example, if you select the account of A.B.Enterprises, then the previous select statement will evaluate the first level of this account using substr(:P16_COACODE,1,1) and coalevel=1 conditions. The substr function will return 2, which is set for the Liabilities nature.

Check Parent Level

This code will check for the existence of the parent level for level 2, 3, and 4 accounts.

```
DECLARE
   VparentFound number := 0;
   VparentCode varchar2(11);
BEGIN

-- First level will not be checked because it doesn't have parent
   if :P16_COALEVEL = 2 then
      VparentCode := substr(:P16_COAcode,1,1);
      select count(*) into VparentFound from gl_coa where
      COAcode=trim(VparentCode) and COAlevel=1 and
      cocode=(select cocode from gl_users where upper(userid)=upper
      (:APP_USER));
   end if;

   if :P16_COALEVEL = 3 then
      VparentCode := substr(:P16_COAcode,1,3);
      select count(*) into VparentFound from gl_coa where
      COAcode=trim(VparentCode) and COAlevel=2 and
      cocode=(select cocode from gl_users where upper(userid)=upper
      (:APP_USER));
   end if;

   if :P16_COALEVEL = 4 then
      VparentCode := substr(:P16_COAcode,1,6);
      select count(*) into VparentFound from gl_coa where
      COAcode=trim(VparentCode) and COAlevel=3 and
      cocode=(select cocode from gl_users where upper(userid)=upper
      (:APP_USER));
   end if;
   if VparentFound = 0 and :P16_COAlevel <> 1 then    -- No parent level
                                                         found and the
                                                         account is not
                                                         parent itself
      return false;                                   -- Displays the
                                                         message: Parent
                                                         level not found
   else
      return true;
   end if;
END;
```

Check Child Level

```
DECLARE
   VchildFound number :=  0;
BEGIN
   select count(*) into VchildFound from gl_coa where COAcode like :P16_
   COAcode||'%' and COAlevel > :P16_COAlevel and
   cocode=(select cocode from gl_users where upper(userid)=upper(:app_
   user));
   if VchildFound > 0 then
      return false;
   else
      return true;
   end if;
END;
```

Check In Transaction

```
DECLARE
   Vdependent number :=  0;
BEGIN
   select count(*) into Vdependent from gl_tran_detail where COAcode =
   :P16_COAcode and
   cocode = (select cocode from gl_users where upper(userid) = upper
   (:app_user));
   if Vdependent > 0 then
      return false;
   else
      return true;
   end if;
END;
```

Disallow Code Modification

```
DECLARE
   VdbCOAcode varchar2(11);
BEGIN
   select COAcode into VdbCOAcode from gl_coa where ROWID=:P16_ROWID;
   if :P16_COAcode <> VdbCOAcode then
      return false;
   else
      return true;
   end if;
END;
```

Save Record

```
DECLARE
   Vcocode number;
BEGIN
   select cocode into Vcocode from gl_users where upper(userid)=upper(
   :APP_USER);
   if :P16_ROWID is null then    -- New Record
      if :P16_COAlevel = 1 then   -- Group Level 1
         insert into gl_coa values (Vcocode,:P16_COAcode,:P16_COAtitle,
         :P16_COAlevel,:P16_COAnature,null,null);
      elsif :P16_COAlevel = 2 or :P16_COAlevel = 3 then    -- Group Levels
                                                              (2 and 3)
         insert into gl_coa values (Vcocode,:P16_COAcode,:P16_COAtitle,
         :P16_COAlevel,:P16_nature_display,null,null);
      else     -- 4th Level
         insert into gl_coa values
         (Vcocode,:P16_COAcode,:P16_COAtitle,:P16_COAlevel,
         :P16_nature_display,:P16_COAtype,:P16_CCcode);
      end if;
   else     -- Record being edited
      if :P16_COAlevel = 1 then    -- Group Levels 1
         update gl_coa set COAtitle=:P16_COAtitle, COAlevel=
         :P16_COAlevel, COAnature=:P16_COAnature where
         ROWID=:P16_ROWID;
      elsif :P16_COAlevel = 2 or :P16_COAlevel = 3 then    -- Group Levels
                                                              (2 and 3)
         update gl_coa set COAtitle=:P16_COAtitle, COAlevel=
         :P16_COAlevel, COAnature=:P16_nature_display where
         ROWID=:P16_ROWID;
      else     -- 4th Level
         update gl_coa set COAtitle=:P16_COAtitle, COAlevel=:P16_COAlevel,
COAnature=:P16_nature_display,
         COAtype=:P16_COAtype, CCcode=:P16_CCcode where ROWID=:P16_ROWID;
      end if;
   end if;
END;
```

Although the update statement contains all columns, you can only modify title, account type, and cost center information on the form.

Delete Record

```
DELETE FROM gl_coa WHERE rowid = :P16_ROWID;
```

Chapter 13

Select Different Companies

```
DECLARE
   Verrortext varchar2(100);
BEGIN
   if :P54_SOURCE = :P54_TARGET THEN
      Verrortext := 'Source and Target companies must be different.';
   end if;
   return rtrim(Verrortext);
END;
```

Check Source COA

```
DECLARE
   VcoaRecords number := 0;
   Verrortext varchar2(200);
BEGIN
   select count(*) into VcoaRecords from gl_coa where cocode=:P54_SOURCE;
   if VcoaRecords <= 0 THEN
      Verrortext := 'Chart of Accounts of  the Source company does not
      exist';
   end if;
   return rtrim(Verrortext);
END;
```

Check Target COA

```
DECLARE
   VcoaRecords number := 0;
   Verrortext varchar2(200);
BEGIN
   select count(*) into VcoaRecords from gl_coa where cocode=:P54_TARGET;
   if VcoaRecords > 0 THEN
      Verrortext := 'Chart of Accounts already exists for the target
       company';
   end if;
   return rtrim(Verrortext);
END;
```

Copy COA

```
DECLARE
   Vcoacode varchar2(11); Vcoatitle varchar2(50); Vcoalevel number(1);
   Vcoanature varchar2(11); Vcoatype varchar2(11);
   Vcccode varchar2(5);
   cursor coa_cur is select * from gl_coa where cocode=:P54_SOURCE order by
   coacode,coalevel;
   coa_rec coa_cur%ROWTYPE;
BEGIN
   for coa_rec in coa_cur loop
      Vcoacode := coa_rec.coacode;
      Vcoatitle := coa_rec.coatitle;
      Vcoalevel := coa_rec.coalevel;
      Vcoanature := coa_rec.coanature;
      Vcoatype := coa_rec.coatype;
      Vcccode := coa_rec.cccode;
      insert into gl_coa values (:P54_TARGET,Vcoacode,Vcoatitle,Vcoalevel,Vc
      oanature,Vcoatype,Vcccode);
      commit;
   end loop;
END;
```

Chapter 14

Check Number Date

```
DECLARE
   Vpfrom date;
   Vpto date;
   Vvoucherfound number := 0;
   Verrortext varchar2(60);
BEGIN
   select count(*) into Vvoucherfound from gl_tran_master where cocode=
   :P43_COCODE and coyear=:P43_COYEAR and
   comonthid=:P43_COMONTHID and vchcode=:P43_VCHCODE and vchno=:P43_VCHNO;
   select pfrom,pto into Vpfrom,Vpto from gl_fiscal_year where cocode=
   :P43_COCODE and coyear=:P43_COYEAR and
   comonthid=:P43_COMONTHID;
   if Vvoucherfound > 0 and :request like 'CREATE%' THEN
      Verrortext := 'Voucher already exist in the database';
   end if;
   if :P43_VCHDATE not between Vpfrom and Vpto then
      Verrortext := 'Voucher date should fall between '||to_char(Vpfrom)||'
and '||to_char(Vpto);
   end if;
   if :P43_VCHNO IS NULL or :P43_VCHNO <= 0 then
      Verrortext := 'Voucher number must be greater than zero';
   end if;
   return rtrim(Verrortext);
END;
```

Check Voucher Details

```
DECLARE
   Vrecords number := 0;
   Verrortext varchar2(60);
BEGIN
   FOR i IN 1 .. apex_application.g_f02.COUNT LOOP -- select a visible
   tabular form column, else the validation won't execute
      Vrecords := Vrecords + i;
   END LOOP;
   if Vrecords <= 1 then
      Verrortext := 'No data defined in the details section';
   end if;
   return rtrim(Verrortext);
END;
```

Check Debit Credit

```
DECLARE
   Verrortext varchar2(1000);
BEGIN
   FOR i IN 1 .. apex_application.g_f02.COUNT LOOP
      if (apex_application.g_f10(i) = 0 and apex_application.g_f11(i) = 0)
      OR (apex_application.g_f10(i) <= 0 and
          apex_application.g_f11(i) <= 0) OR (apex_application.g_f10(i) <> 0
          and apex_application.g_f11(i) <> 0) OR
         (apex_application.g_f10(i) is null or apex_application.g_f11(i) is
         null) then
         Verrortext := 'Row '||i||':&nbsp;&nbsp;Enter zero or a positive
         amount either in Debit or Credit.<br />';
      end if;
   END LOOP;
   return rtrim(Verrortext,'<br />');
END;
```

Voucher Balancing

```
DECLARE
   Verrortext varchar2(1000);
   Vtotaldebit number := 0;
   Vtotalcredit number := 0;
   Vdifference number := 0;
BEGIN
   FOR i IN 1 .. apex_application.g_f02.COUNT LOOP
      Vtotaldebit := Vtotaldebit + to_number(apex_application.g_f10(i));
      Vtotalcredit := Vtotalcredit + to_number(apex_application.g_f11(i));
   END LOOP;
   if  Vtotaldebit <> Vtotalcredit then
      Vdifference := Vtotaldebit - Vtotalcredit;
      Verrortext := 'Voucher is not balanced - Debit='||Vtotaldebit||'
      Credit='||Vtotalcredit||' Difference='||Vdifference;
   end if;
   return rtrim(Verrortext);
END;
```

Control Buttons

```
BEGIN
   if :P43_TRAN_NO IS NOT NULL and :P43_CLOSING=0 and :P43_VCHVERIFIED=
   'N' then
      return true;
   else
      return false;
   end if;
END;
```

Control Navigation Buttons

```
-- PL/SQL Function Body code for GET_PREVIOUS_TRAN_NO
BEGIN
   if :P43_TRAN_NO IS NOT NULL and :P43_CLOSING=0 and :P43_VCHVERIFIED='N'
and :P43_TRAN_NO_PREV IS NOT NULL
   then
      return true;
   else
      return false;
   end if;
END;

-- PL/SQL Function Body code for GET_NEXT_TRAN_NO
begin
   if :P43_TRAN_NO IS NOT NULL and :P43_CLOSING=0 and :P43_VCHVERIFIED='N'
   and :P43_TRAN_NO_NEXT IS NOT NULL
   then
      return true;
   else
      return false;
   end if;
end;
```

Chapter 17

Report Query

```
SELECT
            CO.coname,
            VM.Vchcode,
            VCH.Vchtitle,
            VM.Vchno,
            VM.Vchdate,
            VM.Vchdescription,
            VM.createdby,
            VM.createdon,
            VD.line_no,
            VD.COAcode,
            COA.COAtitle,
            VD.CCCode,
            CC.CCTitle,
            VD.Vchdr,
            VD.Vchcr,
            VD.Vchreference, (SELECT TO_CHAR(SYSDATE, 'DD-MON-YYYY
            HH24:MI:SS') FROM DUAL) NOW
FROM GL_COMPANY CO, GL_VOUCHER VCH, GL_COA COA, GL_COST_CENTER CC, GL_TRAN_
MASTER VM,
             GL_TRAN_DETAIL VD
WHERE VM.VchCode=:P71_VCHCODE AND VM.Vchdate between :P71_VCHDATEFROM and
:P71_VCHDATETO AND
               VM.createdon between :P71_CREATEDFROM and :P71_CREATEDTO AND
               VM.vchno BETWEEN :P71_VCHNOFROM and :P71_VCHNOTO AND
               upper(VM.createdby)=upper(:P71_USERID) AND
               VM.cocode=(select cocode from GL_USERS where
upper(userid)=upper(:APP_USER)) AND
               VM.cocode=CO.cocode AND
               VM.tran_no=VD.tran_no AND
               VM.Vchcode=VCH.Vchcode AND
               VD.cocode=COA.cocode AND
               VD.COAcode=COA.COAcode AND
               VD.CCCode=CC.CCCode(+)
ORDER BY VCHCODE,VCHNO,LINE_NO
```

Check Data

```
DECLARE
   Vvouchersfound number := 0;
   Verrortext varchar2(100);
BEGIN
   select count(*) into Vvouchersfound from gl_tran_master VM
   where VM.VchCode=:P71_VCHCODE AND VM.Vchdate between :P71_VCHDATEFROM and
:P71_VCHDATETO AND
                VM.createdon between :P71_CREATEDFROM and :P71_CREATEDTO AND
                VM.vchno BETWEEN :P71_VCHNOFROM and :P71_VCHNOTO AND
                upper(VM.createdby)=upper(:P71_USERID) AND
                VM.cocode=(select cocode from GL_USERS where
upper(userid)=upper(:APP_USER));
   if Vvouchersfound <= 0 THEN
      Verrortext := 'No data found for the given criteria';
   end if;
   return rtrim(Verrortext);
END;
```

Chapter 18

IR SQL Query

```
SELECT coacode, coatitle, tran_no, vchdate, vchcode, vchtype, vchno,
vchdescription, vchdr, vchcr, SUM (vchdr - vchcr) OVER (partition by coacode
ORDER BY coacode, vchdate, tran_no, vchno) as balance
FROM    (
              SELECT  TD.coacode, COA.coatitle, 0 as tran_no, to_date
              (:P72_FROM,'DD-MON-YYYY') - 1 as vchdate
        , 0 as vchcode
        , '' as vchtype           The SELECT statement calculates opening balances of accounts as of the P72_FROM date.

              , null as vchno
              ,'Opening Balance as on '||to_char(to_date
               (:P72_FROM,'DD-MON-YYYY') - 1) as Vchdescription
              ,sum(TD.vchdr) as vchdr
              ,sum(TD.vchcr) as vchcr
              ,1 AS grp
              FROM    gl_coa COA, gl_voucher VCH, gl_tran_master TM, gl_
              tran_detail TD
               WHERE TM.vchdate < to_date(:P72_FROM, 'DD-MON-YYYY') and
               TD.coacode=COA.coacode and
                             TD.coacode >=  :P72_ACCOUNTFROM and TD.coacode
                             <= :P72_ACCOUNTTO and
                             TM.cocode=(select cocode from gl_users where
                             upper(userid)=upper(:APP_USER)) and
                             TM.tran_no=TD.tran_no and TM.vchcode=VCH.
                             vchcode and
               COA.cocode=TM.cocode
             GROUP BY TD.coacode, COA.coatitle
                      --
                  UNION ALL          Combines the results of the two SELECT statements.
                      --

             SELECT  TD.coacode, COA.coatitle, TM.tran_no, TM.vchdate
             ,       TM.vchcode      Retrieves transaction data for the specified period.
             ,        VCH.vchtype

             ,      TM.vchno
             ,      TD.vchdescription
             ,      TD.vchdr
             ,      TD.vchcr
             ,      2 AS grp
             FROM    gl_coa COA, gl_voucher VCH, gl_tran_master
             TM, gl_tran_detail TD
```

```
               WHERE TM.vchdate between to_date(:P72_FROM,'DD-MON-YYYY') and
               to_date(:P72_TO, 'DD-MON-YYYY') and
                              TD.coacode=COA.coacode and TD.coacode >= :P72_
                              ACCOUNTFROM and
                              TD.coacode <= :P72_ACCOUNTTO and
                             TM.cocode=(select cocode from gl_users where
                             upper(userid)=upper(:APP_USER)) and
                             TM.tran_no=TD.tran_no and TM.vchcode=VCH.
                             vchcode and COA.cocode=TM.cocode
               )
ORDER BY coacode, grp, vchdate, vchno
```

PDF Report Query

```
SELECT coname, coacode, coatitle, tran_no, vchdate, vchtype,vchno,
vchdescription, vchdr, vchcr, SUM (vchdr - vchcr)
OVER (partition by coacode ORDER BY coacode, vchdate, tran_no, vchno) as
balance,
           (SELECT TO_CHAR(SYSDATE, 'DD-MON-YYYY HH24:MI:SS') FROM DUAL)
           NOW,:P72_FROM FromDate,
            :P72_TO ToDate, :P72_ACCOUNTFROM AccountFrom,:P72_ACCOUNTTO
            Accountto
FROM    (
              SELECT  CO.coname, TD.coacode, COA.coatitle, 0 as tran_no,
              to_date(:P72_FROM,'DD-MON-YYYY') - 1 as vchdate
              ,       '' as vchtype
              ,       0 as vchno
              ,       '<<< Opening Balance >>>' as Vchdescription
              ,       sum(TD.vchdr) as vchdr
              ,       sum(TD.vchcr) as vchcr
              ,       1 AS grp
             FROM    gl_company CO, gl_coa COA, gl_voucher VCH, gl_tran_
             master TM, gl_tran_detail TD
               WHERE TM.vchdate < to_date(:P72_FROM, 'DD-MON-YYYY') and
               TD.coacode=COA.coacode and
                              TD.coacode >= :P72_ACCOUNTFROM and TD.coacode
                              <= :P72_ACCOUNTTO and
                              TM.cocode=(select cocode from gl_users where
                              upper(userid)=upper(:APP_USER)) and
                              TM.tran_no=TD.tran_no and TM.vchcode=VCH.
                              vchcode and TM.cocode=CO.cocode and
                              COA.cocode=TM.cocode
             GROUP BY CO.coname, TD.coacode, COA.coatitle
                      --
                  UNION ALL
                      --
             SELECT  CO.coname, TD.coacode, COA.coatitle, TM.tran_no
             ,       TM.vchdate
             ,       VCH.vchtype
             ,       TM.vchno
             ,       TD.vchdescription
             ,       TD.vchdr
             ,       TD.vchcr
             ,       2 AS grp
             FROM    gl_company CO, gl_coa COA, gl_voucher VCH, gl_tran_
             master TM, gl_tran_detail TD
             WHERE  TM.vchdate between to_date(:P72_FROM,'DD-MON-YYYY') and
             to_date(:P72_TO, 'DD-MON-YYYY') and
                    TD.coacode=COA.coacode and TD.coacode >=
                    :P72_ACCOUNTFROM and
                    TD.coacode <= :P72_ACCOUNTTO  and
                    TM.cocode=(select cocode from gl_users where
                    upper(userid)=upper(:APP_USER)) and
                    TM.tran_no=TD.tran_no and TM.vchcode=VCH.vchcode and
                    TM.cocode=CO.cocode and
                    COA.cocode=TM.cocode
            )
ORDER BY vchdate,vchno
```

Check Data

```
DECLARE
   Vdatafound number := 0;
   Verrortext varchar2(100);
BEGIN
   select count(*) into Vdatafound from gl_tran_master TM, gl_tran_detail TD
   where TM.vchdate <= to_date(:P72_TO, 'DD-MON-YYYY') and TD.coacode >=
   :P72_ACCOUNTFROM and
                 TD.coacode <= :P72_ACCOUNTTO and
                TM.cocode=(select cocode from gl_users where
                upper(userid)=upper(:APP_USER));
   if Vdatafound <= 0 THEN
      Verrortext := 'No data found for the given criteria';
   end if;
   return rtrim(Verrortext);
END;
```

Drilled Down Voucher

```
SELECT
              TD.LINE_NO,
              TD.TRAN_NO,
              TD.COCODE,
              TD.COACODE,
              TD.CCCODE,
              TD.VCHDESCRIPTION,
              TD.VCHDR,
              TD.VCHCR,
              TD.VCHREFERENCE,
              TD.RECONCILED
FROM   GL_TRAN_DETAIL TD, GL_TRAN_MASTER TM
WHERE TD.TRAN_NO = TM.TRAN_NO and
               TM.VCHDATE = TO_DATE(:P44_VCHDATE,'DD-MON-YYYY') and
               TM.VCHCODE = TO_NUMBER(:P44_VCHCODE) and
               TM.VCHNO = TO_NUMBER(:P44_VCHNO) and
               TM.COCODE = (select cocode from gl_users where
               upper(userid)=upper(:APP_USER))
```

Chapter 19

Generate Trial Balance

```
DECLARE
   Vstartdate date; VcoacodeSearch varchar2(20); Vcoacode varchar2(11);
   Vcoatitle varchar2(50); Vcoalevel number;
   Vcctitle varchar2(25); Vcocode number; Vconame varchar2(50); Vopendr
   number; Vopencr number; VactivityDr number;
   VactivityCr number; VcumulativeDr number; VcumulativeCr number;
   VclosingBalDr number; VclosingBalCr number;
   VtotalOpenDr number; VtotalOpenCr number; VtotalActivityDr number;
   VtotalActivityCr number;
   VtotalClosingDr number; VtotalClosingCr number;
   cursor tb_cur is
   select coacode,coatitle,coalevel from gl_coa where coacode between :P73_
   ACCOUNTFROM and :P73_ACCOUNTTO and
   coalevel <= :P73_COALEVEL and cocode=(select cocode from gl_users where
   upper(userid)=upper(:APP_USER))
   order by coacode;
   tb_rec tb_cur%ROWTYPE;
BEGIN
   delete from gl_trial_balance where upper(userid)=upper(:APP_USER);
    -- delete existing TB of the current user
   commit;
   select cocode into Vcocode from gl_users where upper(userid)=upper(:APP_
   USER);
   select coname into Vconame from gl_company where cocode=Vcocode;
   select pfrom into Vstartdate from gl_fiscal_year where cocode=Vcocode and
              coyear=(select coyear from gl_users where
              upper(userid)=upper(:APP_USER)) and comonthid=1;
   for tb_rec in tb_cur loop
      Vcoacode := tb_rec.coacode;
      VcoacodeSearch := tb_rec.coacode||'%';
      Vcoatitle := tb_rec.coatitle;
      Vcoalevel := tb_rec.coalevel;
      if :P73_CCCODE is null THEN  -- If no cost center is selected
         select sum(TD.vchdr) into Vopendr from gl_tran_master TM, gl_tran_
         detail TD where TM.tran_no=TD.tran_no and
                                 TD.coacode like VcoacodeSearch and
                                 TM.cocode=Vcocode and TM.vchdate < Vstartdate;
         select sum(TD.vchcr) into Vopencr from gl_tran_master TM, gl_tran_
         detail TD where TM.tran_no=TD.tran_no and
                                 TD.coacode like VcoacodeSearch and
                                 TM.cocode=Vcocode and TM.vchdate < Vstartdate;
         select sum(TD.vchdr) into VactivityDr from gl_tran_master TM, gl_
         tran_detail TD where TM.tran_no=TD.tran_no and
```

```
                              TD.coacode like VcoacodeSearch and
                              TM.cocode=Vcocode and TM.vchdate between
                              Vstartdate and
                              to_date(:P73_TBDATE,'DD-MON-YYYY') and
                              TM.closing=0;
        select sum(TD.vchcr) into VactivityCr from gl_tran_master TM, gl_
        tran_detail TD where TM.tran_no=TD.tran_no and
                              TD.coacode like VcoacodeSearch and
                              TM.cocode=Vcocode and TM.vchdate between
                              Vstartdate and
                              to_date(:P73_TBDATE,'DD-MON-YYYY') and
                              TM.closing=0;
    else
        select cctitle into Vcctitle from gl_cost_center where cccode=:P73_
        CCCODE;       -- Print CCTITLE on TB PDF
        select sum(TD.vchdr) into Vopendr from gl_tran_master TM, gl_tran_
        detail TD where TM.tran_no=TD.tran_no and
                              TD.coacode like VcoacodeSearch and
                              TM.cocode=Vcocode and TM.vchdate < Vstartdate and
                              TD.cccode=:P73_CCCODE;
        select sum(TD.vchcr) into Vopencr from gl_tran_master TM, gl_tran_
        detail TD where TM.tran_no=TD.tran_no and
                              TD.coacode like VcoacodeSearch and
                              TM.cocode=Vcocode and TM.vchdate < Vstartdate
                              and
                              TD.cccode=:P73_CCCODE;
        select sum(TD.vchdr) into VactivityDr from gl_tran_master TM, gl_
        tran_detail TD where TM.tran_no=TD.tran_no and
                              TD.coacode like VcoacodeSearch and
                              TM.cocode=Vcocode and TM.vchdate between
                              Vstartdate and
                              to_date(:P73_TBDATE,'DD-MON-YYYY') and
                              TM.closing=0 and TD.cccode=:P73_CCCODE;
        select sum(TD.vchcr) into VactivityCr from gl_tran_master TM, gl_
        tran_detail TD where TM.tran_no=TD.tran_no and
                              TD.coacode like VcoacodeSearch and
                              TM.cocode=Vcocode and TM.vchdate between
                              Vstartdate and
                              to_date(:P73_TBDATE,'DD-MON-YYYY') and
                              TM.closing=0 and TD.cccode=:P73_CCCODE;
    end if;

-- Calculate closing balance
    VcumulativeDr := nvl(VopenDr,0) + nvl(VactivityDr,0);
    -- Sum up opening and activity debits
    VcumulativeCr := nvl(VopenCr,0) + nvl(VactivityCr,0);
    -- Sum up opening and activity credits
    if VcumulativeDr > VcumulativeCr then
```

```
         VclosingBalDr := VcumulativeDr - VcumulativeCr;
         --  Closing balance is debit
         VclosingBalCr := 0;
      elsif VcumulativeCr > VcumulativeDr then
         VclosingBalDr := 0;
         VclosingBalCr := VcumulativeCr - VcumulativeDr;
         --  Closing balance is credit
      else  -- Both are equal
         VclosingBalDr := 0;
         VclosingBalCr := 0;
      end if;
     if Vopendr=Vopencr then -- Previous year's balance is zero (It's an
                                Income or Expense account)
        insert into gl_trial_balance values
        (Vcoacode,Vcoatitle,Vcoalevel,0,0,VactivityDR,VactivityCR,VclosingBa
        lDr,VclosingBalCr,Vconame,
         :P73_TBDATE,:P73_ACCOUNTFROM,:P73_ACCOUNTTO,:P73_
         CCCODE,Vcctitle,:P73_COALEVEL,upper(:APP_USER),0);
     else
        insert into gl_trial_balance values
        (Vcoacode,Vcoatitle,Vcoalevel,Vopendr,Vopencr,VactivityDR,VactivityC
        R,VclosingBalDr,VclosingBalCr,Vconame,
         :P73_TBDATE,:P73_ACCOUNTFROM,:P73_ACCOUNTTO,:P73_
         CCCODE,Vcctitle,:P73_COALEVEL,upper(:APP_USER),0);
     end if;
     commit;
   end loop;
-- Calculate & insert grand totals
   select sum(opendr) into VtotalOpenDr from gl_trial_balance where
   upper(userid)=upper(:APP_USER) and
              coalevel=:P73_COALEVEL;
   select sum(opencr) into VtotalOpenCr from gl_trial_balance where
   upper(userid)=upper(:APP_USER) and
              coalevel=:P73_COALEVEL;
   select sum(activitydr) into VtotalActivityDr from gl_trial_balance where
   upper(userid)=upper(:APP_USER) and
              coalevel=:P73_COALEVEL;
   select sum(activitycr) into VtotalActivityCr from gl_trial_balance where
   upper(userid)=upper(:APP_USER) and
              coalevel=:P73_COALEVEL;
   select sum(closingdr) into VtotalClosingDr from gl_trial_balance where
   upper(userid)=upper(:APP_USER) and
              coalevel=:P73_COALEVEL;
   select sum(closingcr) into VtotalClosingCr from gl_trial_balance where
   upper(userid)=upper(:APP_USER) and
              coalevel=:P73_COALEVEL;
   insert into gl_trial_balance (coatitle,coalevel,opendr,opencr,activitydr,
   activitycr,closingdr,closingcr,userid,grand_total)
   values ('GRAND TOTAL FOR LEVEL '||:P73_COALEVEL,:P73_COALEVEL,Vtotalopend
   r,Vtotalopencr,VtotalactivityDR,
   VtotalactivityCR,VtotalclosingDr,VtotalclosingCr,upper(:APP_USER),1);
   commit;
-- Replace zeros with nulls for clear presentation
   update gl_trial_balance set opendr=null where opendr=0;
   update gl_trial_balance set opencr=null where opencr=0;
   update gl_trial_balance set activitydr=null where activitydr=0;
   update gl_trial_balance set activitycr=null where activitycr=0;
   update gl_trial_balance set closingdr=null where closingdr=0;
   update gl_trial_balance set closingcr=null where closingcr=0;
   commit;
END;
```

Check Data

```
DECLARE
   Vdatafound number := 0;
   Verrortext varchar2(100);
BEGIN
   if :P73_CCCODE is null THEN     -- No cost center selected
      select count(*) into Vdatafound from gl_tran_master TM, gl_tran_detail
      TD
      where TM.vchdate <= to_date(:P73_TBDATE, 'DD-MON-YYYY') and
                  TD.coacode >= :P73_ACCOUNTFROM and TD.coacode <= :P73_
                  ACCOUNTTO and
                  TM.cocode=(select cocode from gl_users where
                  upper(userid)=upper(:APP_USER));
   else
      select count(*) into Vdatafound from gl_tran_master TM,
      gl_tran_detail TD
      where TM.vchdate <= to_date(:P73_TBDATE, 'DD-MON-YYYY') and
                  TD.coacode >= :P73_ACCOUNTFROM and TD.coacode <= :P73_
                  ACCOUNTTO and
                  TD.cccode = :P73_CCCODE and
                  TM.cocode=(select cocode from gl_users where
upper(userid)=upper(:APP_USER));
   end if;
   if Vdatafound <= 0 THEN
      Verrortext := 'No data found for the given criteria';
   end if;
   return rtrim(Verrortext);
END;
```

Chapter 20

Check Debit Credit

g_f07 represents the Debit column in the tabular form, whereas g_f08 represents the Credit column.

```
DECLARE

   Verrortext varchar2(1000);
BEGIN
   FOR i IN 1 .. apex_application.g_f02.COUNT LOOP
      if (apex_application.g_f07(i) = 0 and
      apex_application.g_f08(i) = 0) OR
         (apex_application.g_f07(i) <= 0 and
         apex_application.g_f08(i) <= 0) OR
         (apex_application.g_f07(i) <> 0 and
         apex_application.g_f08(i) <> 0) OR
         (apex_application.g_f07(i) is null or
         apex_application.g_f08(i) is null) then
         Verrortext := 'Row '||i||':&nbsp;&nbsp;Enter positive amount either
         in Debit or Credit.<br />';
      end if;
   END LOOP;
   return rtrim(Verrortext,'<br />');
END;
```

Chapter 22

Generate Reconciliation Report

```
DECLARE
   Vcocode number; VactivityDr number := 0; VactivityCr number := 0;
   VclosingBal number := 0; Vconame varchar2(50);
   Vbanktitle  varchar2(50); Vosdebit    number := 0; Voscredit
   number := 0; Vamount number := 0;
   VtranDebit  number := 0; VtranCredit number := 0; Vmonthyear
   varchar2(14); Vvchdate date; Vvchtype varchar2(6);
   Vvchno number := 10; Vvchdescription varchar2(150); Vremarks
   varchar2(150); Vvchreference varchar2(25);
   Vsrno number := 1; VbankBalance number := 0;

-- Opening Bank Transactions Cursor
   cursor os_cur is
   select remarks,vchdr,vchcr from gl_banks_os where cocode=(select cocode
   from gl_users where
   upper(userid)=upper(:APP_USER)) and coacode=:P74_BANK and reconciled=0
   order by sr_no;

-- Bank's current transactions cursor
   cursor tran_cur is
   SELECT  TM.VCHDATE, VCH.VCHTYPE, TM.VCHNO, TD.VCHDESCRIPTION,
   TD.VCHREFERENCE, TD.VCHDR, TD.VCHCR
   FROM   GL_VOUCHER VCH, GL_TRAN_MASTER TM, GL_TRAN_DETAIL TD
   WHERE TM.COCODE=TD.COCODE AND TM.TRAN_NO=TD.TRAN_NO AND  TM.VCHCODE=VCH.
   VCHCODE AND
              TM.vchdate <= to_date(:P74_REPORTDATE,'DD-MON-YYYY') AND
              TM.CLOSING=0 AND
              TM.VCHDESCRIPTION <> 'OPENING BALANCES' AND
              TM.COCODE=(select cocode from gl_users where
              upper(userid)=upper(:APP_USER)) AND
              TD.COACODE=:P74_BANK AND TD.RECONCILED=0
   ORDER BY TM.vchdate;
   os_rec os_cur%ROWTYPE;
   tran_rec tran_cur%ROWTYPE;

BEGIN
   delete from gl_reconcile_report where upper(userid)=upper(:APP_USER);
-- Delete user's existing report
   commit;
   select cocode into Vcocode from gl_users where upper(userid)=upper
   (:APP_USER);
   select coname into Vconame from gl_company where cocode=Vcocode;
   select coatitle into Vbanktitle from gl_coa where coacode=:P74_BANK and
   cocode=Vcocode;
```

```
-- Evaluate bank's balance as per ledger
   SELECT  sum(TD.vchdr), sum(TD.vchcr) into VactivityDr,VactivityCr
   FROM    gl_tran_master TM, gl_tran_detail TD
   WHERE TM.tran_no=TD.tran_no and TM.cocode=Vcocode AND TD.coacode=:P74_
   BANK AND
                  TM.vchdate <= to_date(:P74_REPORTDATE,'DD-MON-YYYY') AND
                  TM.cocode=TD.cocode AND TM.closing=0;

    if VactivityDr > VactivityCr then
         VclosingBal := VactivityDr - VactivityCr;
      elsif VactivityCr > VactivityDr then
         VclosingBal := VactivityCr - VactivityDr;
         VclosingBal := VclosingBal-(VclosingBal * 2); -- Make overdraft
                                                          (OD) balance
                                                          negative
      else
         VclosingBal := 0;
      end if;

      insert into gl_reconcile_report values (Vsrno,upper(:APP_
      USER),Vconame,
      to_date(:P74_REPORTDATE,'DD-MON-YYYY'),:P74_BANK,Vbanktitle,null,null,
      null,null,'Balance as per Ledger',
      null,VclosingBal);
      commit;

--  Incorporate opening transactions
   for os_rec in os_cur loop                    -- os stands for opening
                                                   outstanding

      Vsrno := Vsrno + 1;
      Vremarks := os_rec.remarks;
      Vosdebit := os_rec.vchdr;
      Voscredit := os_rec.vchcr;
      if Vosdebit > 0 then
         Vamount := Vosdebit;
         Vamount := Vamount-(Vamount * 2);      -- Made negative to deduct
                                                   the amount.

      elsif Voscredit > 0 then
         Vamount := Voscredit;
      else
         Vamount := 0;
      end if;
      insert into gl_reconcile_report
values (Vsrno,upper(:APP_USER),Vconame,
```

This is a deposited amount that is recorded in the company's ledger but hasn't appeared in the bank statement. To reconcile the ledger balance with the bank balance, this amount should be deducted from the ledger balance.

```
      to_date(:P74_REPORTDATE,'DD-MON-YYYY'),:P74_BANK,Vbanktitle,null,null,
      null,null,Vremarks,null,Vamount);
      commit;
   end loop;

--  Incorporate current transactions
   for tran_rec in tran_cur loop
      Vsrno := Vsrno + 1;
      Vvchdate := tran_rec.vchdate;
      Vvchtype := tran_rec.vchtype;
      Vvchno   := tran_rec.vchno;
      Vvchdescription := tran_rec.vchdescription;
      Vvchreference := tran_rec.vchreference;
      VtranDebit := tran_rec.vchdr;
      VtranCredit := tran_rec.vchcr;
      Vmonthyear := TRIM(to_char(Vvchdate,'Month'))||'-'||to_
      char(Vvchdate,'YYYY');
      if VtranDebit > 0 then
         Vamount := VtranDebit;
         Vamount := Vamount-(Vamount * 2);       -- Made negative to deduct
                                                    the deposited amount not
                                                    appearing in the BS
      elsif VtranCredit > 0 then
         Vamount := VtranCredit;
      else
         Vamount := 0;
      end if;
      insert into gl_reconcile_report values (Vsrno,upper
      (:APP_USER),Vconame,
      to_date(:P74_REPORTDATE,'DD-MON-YYYY'),:P74_BANK,Vbanktitle,Vmonthyear
      ,Vvchdate,Vvchtype,Vvchno,
      Vvchdescription,Vvchreference,Vamount);
      commit;
   end loop;

-- Calculate and insert bank balance based on the figures instered above
   select sum(amount) into VbankBalance from gl_reconcile_report where
   upper(userid)=upper(:APP_USER);
   insert into gl_reconcile_report values (Vsrno+1,upper(:APP_USER),Vconame,
   to_date(:P74_REPORTDATE,'DD-MON-YYYY'),:P74_BANK,Vbanktitle,null,null,nul
   l,null,'Balance as per bank statement',
   null,VbankBalance);
   commit;
END;
```

Chapter 23

Check Month Closure

```
DECLARE
   Vmonthclosed number := 0;
   Verrortext varchar2(100);
BEGIN
   select month_closed into Vmonthclosed from gl_fiscal_year
   where cocode=(select cocode from gl_users where upper(userid)=upper
   (:APP_USER)) and
         coyear=(select coyear from gl_users where upper(userid)=upper(:APP_
         USER)) and
         comonthid=:P96_COMONTH;
   if Vmonthclosed = 1 THEN
      Verrortext := 'Cannot proceed with this process because the selected
      month is already marked as closed';
   end if;
   return rtrim(Verrortext);
END;
```

Chapter 24

Check Permanent Year Closure

```
DECLARE
   Vyearclosed number := 0;
   Verrortext varchar2(100);
BEGIN
   select count(*) into Vyearclosed from gl_fiscal_year
   where year_closed=1 and cocode=(select cocode from gl_users where
   upper(userid)=upper(:APP_USER)) and
               coyear=(select coyear from gl_users where
               upper(userid)=upper(:APP_USER));
   if Vyearclosed > 0 THEN
      Verrortext := 'Cannot proceed with this process because year is
      already permanently closed';
   end if;
   return rtrim(Verrortext);
END;
```

Generate Fiscal Year

```
DECLARE
   Vyearexist number := 0; Vnextyear  number := 0; Vcoyear number := 0;
   Vcocode number := 0; Vcomonthid number := 0;
   Vcomonthname varchar2(9); Vpfrom varchar2(11); Vpto varchar2(11);
   Vleapyear number; Vprev_rec_year varchar2(4);
   cursor fy_cur is
   select * from gl_fiscal_year where cocode=(select cocode from gl_users
   where upper(userid)=upper(:APP_USER)) and
   coyear=(select coyear from gl_users where upper(userid)=upper(:APP_
   USER));
   fy_rec fy_cur%ROWTYPE;
BEGIN
   select cocode, coyear+1, coyear+1, to_char(coyear) into
   Vcocode,Vcoyear,Vnextyear,Vprev_rec_year from gl_users
   where upper(userid)=upper(:APP_USER);
   select count(*) into Vyearexist from gl_fiscal_year
   where cocode=(select cocode from gl_users where upper(userid)=upper
   (:APP_USER)) and coyear=Vcoyear;
   if Vyearexist = 0 then    -- New fiscal year not found so create it
      for fy_rec in fy_cur loop
         Vcomonthid   := fy_rec.comonthid;
         Vcomonthname := fy_rec.comonthname;
         Vpfrom := substr(to_char(fy_rec.pfrom,
         'DD-MON-YYYY'),1,7)||Vnextyear;
         Vpto   := substr(to_char(fy_rec.pto,
         'DD-MON-YYYY'),1,7)||Vnextyear;
         if to_char(fy_rec.pfrom,'YYYY')
         <> Vprev_rec_year then
            Vnextyear := Vnextyear + 1;
            Vpfrom := substr(to_char(fy_rec.pfrom,
            'DD-MON-YYYY'),1,7)||Vnextyear;
            Vpto   := substr(to_char(fy_rec.pto,
            'DD-MON-YYYY'),1,7)||Vnextyear;
         end if;
         if Vcomonthname = 'February' then
            Vleapyear := mod(Vnextyear,4);
            if Vleapyear = 0 then
               Vpto := '29-FEB-'||Vnextyear;
            else
               Vpto := '28-FEB-'||Vnextyear;
            end if;
         end if;
         insert into gl_fiscal_year values (Vcocode,Vcoyear,Vcomonthid,Vcom
         onthname,
         to_date(Vpfrom,'DD-MON-YYYY'),to_date(Vpto,'DD-MON-
         YYYY'),0,0,0,null);
         commit;
         Vprev_rec_year := to_char(fy_rec.pfrom,'YYYY');
      end loop;
   end if;
END;
```

If Vnextyear is 2016, then Vpfrom and Vpto will have 01-JUL-2016 and 31-JUL-2016 values, respectively, for the month of July.

Provision made for the next year for January and onward months.

Generate Closing Entry

```
DECLARE
   VoldClosingEntry number;
   Vtran_no number;
   Vline_no number;
   Vcoacode varchar2(11);
   Vcocode number;
   Vcoyear number;
   Vvchdate date;
   Vactivitydr number;
   Vactivitycr number;
   VnetDebit number;
   VnetCredit number;
   VcumulativeDebit number := 0;
   VcumulativeCredit number := 0;
```

A closing entry is created to close all expense and revenue accounts into a profit and loss account. The cursor fetches all accounts marked as either revenue or expense.

```
   Vloss number;
   Vprofit number;
   cursor tye_cur is
   select  TD.coacode coacode, sum(TD.vchdr) activitydr, sum(TD.vchcr)
   activitycr
   from    gl_coa coa, gl_tran_master TM, gl_tran_detail TD
   where TM.tran_no=TD.tran_no and TD.coacode=COA.coacode and coa.cocode=td.
   cocode and
               TM.cocode=(select cocode from gl_users where
               upper(userid)=upper(:APP_USER)) and
               TM.coyear=(select coyear from gl_users where
               upper(userid)=upper(:APP_USER)) and TM.closing=0 and
               COA.coanature in ('Revenue','Expenses')
   group by TD.coacode order by TD.coacode;
   tye_rec tye_cur%ROWTYPE;
BEGIN
  BEGIN
      select  distinct(TM.tran_no) into VoldClosingEntry -- Locate and
                                                            remove existing
                                                            closing entry
      from    gl_tran_master TM
      where TM.cocode=(select cocode from gl_users where
      upper(userid)=upper(:APP_USER)) and
                  TM.coyear=(select coyear from gl_users where
                  upper(userid)=upper(:APP_USER)) and TM.closing=1;
      delete from gl_tran_detail where tran_no=VoldClosingEntry;
      delete from gl_tran_master where tran_no=VoldClosingEntry;
      commit;

  EXCEPTION
      WHEN NO_DATA_FOUND then
      VoldClosingEntry := 0;
  END;
  select gl_tran_master_seq.nextval into Vtran_no from dual;

  select  cocode,coyear,pto into Vcocode,Vcoyear,Vvchdate
  from gl_fiscal_year
  where cocode=(select cocode from gl_users where upper(userid)=upper
  (:APP_USER)) and
              coyear=(select coyear from gl_users where
              upper(userid)=upper(:APP_USER)) and comonthid=12;

   insert into gl_tran_master values (Vtran_no,Vcocode,Vcoyear,12,:P93_
VCHCODE,9999999999,Vvchdate,
   'Closing Entry',upper(:APP_USER),sysdate,'Y','Y',1);      -- Master record
                                                               instered
   commit;
```

The statement evaluates the current company, year, and the last date of the current fiscal year.

A closing entry is autogenerated and appears on the last date of the fiscal year (i.e., 30th June) and is numbered as 9999999999. The value 1 in the closing column of the table signifies that it is a closing entry.

```
   for tye_rec in tye_cur loop
   -- Insert detail records
      select gl_tran_detail_seq.nextval
      into Vline_no from dual;
      Vcoacode := tye_rec.coacode;
      Vactivitydr := tye_rec.activitydr;
      Vactivitycr := tye_rec.activitycr;

      if Vactivitydr > Vactivitycr then
         VnetDebit := Vactivitydr - Vactivitycr;
         VnetCredit := 0;
         VcumulativeDebit := VcumulativeDebit + VnetDebit;
      elsif Vactivitycr > Vactivitydr then
         VnetCredit := Vactivitycr - Vactivitydr;
         VnetDebit := 0;
         VcumulativeCredit := VcumulativeCredit + VnetCredit;
      else
         VnetDebit := 0;
         VnetCredit := 0;
      end if;
      if VnetDebit > 0 or VnetCredit > 0 then
         insert into gl_tran_detail values (Vline_no,Vtran_no,Vcocode,Vcoaco
         de,null,'Closing Entry',VnetCredit,VnetDebit,
         null,0);
         commit;
      end if;
   end loop;
-- Record the difference of revenues and expenses in the profit and loss
   account
   select gl_tran_detail_seq.nextval into Vline_no from dual;
   if VcumulativeDebit > VcumulativeCredit then
      Vloss := VcumulativeDebit - VcumulativeCredit;      -- Loss: expenses
                                                             exceeded
                                                             reveunes
      Vprofit := 0;
   elsif VcumulativeCredit > VcumulativeDebit then
      Vloss := 0;
      Vprofit := VcumulativeCredit - VcumulativeDebit;   -- Profit: revenues
                                                            exceeded
                                                            expenses
   else
```

```
      Vloss := 0;
      Vprofit := 0;
   end if;
   if Vloss > 0 or Vprofit > 0 then
      insert into gl_tran_detail values (Vline_no,Vtran_no,Vcocode,:P93_
      PLACCOUNT,null,'Closing Entry',Vloss,Vprofit,null,0);
      commit;
   end if;
   update gl_fiscal_year set TYE_Executed=SYSDATE      -- Record temporary
                                                          year end execution
                                                          date
   where cocode=(select cocode from gl_users where upper(userid)=upper
   (:APP_USER)) and
            coyear=(select coyear from gl_users where
            upper(userid)=upper(:APP_USER));
   commit;
END;
```

Permanent Year Closure

```
DECLARE
   Vyearclosed number := 0;
   Verrortext varchar2(100);
BEGIN
   select  count(*) into Vyearclosed from gl_fiscal_year
   where year_closed=1 and
            cocode=(select cocode from gl_users where
            upper(userid)=upper(:APP_USER)) and
            coyear=(select coyear from gl_users where
            upper(userid)=upper(:APP_USER));
   if Vyearclosed > 0 THEN
      Verrortext := 'Cannot proceed with this process because year is
      already closed permanently';
   end if;
   return rtrim(Verrortext);
END;
```

Check Months Closure

```
DECLARE
   Vunclosed number := 0;
   Verrortext varchar2(100);
BEGIN
   select  count(*) into Vunclosed from gl_fiscal_year
   where month_closed=0 and cocode=(select cocode from gl_users where
   upper(userid)=upper(:APP_USER)) and
               coyear=(select coyear from gl_users where
               upper(userid)=upper(:APP_USER));
   if Vunclosed >= 1 THEN
      Verrortext := Vunclosed||' month(s) found unclosed. Cannot proceed
      with this process';
   end if;
   return rtrim(Verrortext);
END;
```

Check Temporary Year End Date

```
DECLARE
   Vtyedate date;
   Verrortext varchar2(100);
BEGIN
   select  TYE_Executed into Vtyedate from gl_fiscal_year
   where cocode=(select cocode from gl_users where upper(userid)=upper
   (:APP_USER)) and
               coyear=(select coyear from gl_users where
               upper(userid)=upper(:APP_USER)) and comonthid=1;
   if TRUNC(Vtyedate) < TRUNC(SYSDATE) or Vtyedate is null THEN
      Verrortext := 'Kindly execute Temporary Year End Process to create
      fresh closing entries';
   end if;
   return rtrim(Verrortext);
END;
```

Chapter 25

User Defined Budget

```
DECLARE
   Vbudgetrecords number := 0;
   Vcoacode varchar2(11);
   cursor coa_cur is
   select coacode from gl_coa where cocode=:P55_COCODE and coanature=:P55_
COANATURE and coalevel=4
   order by coacode;
   coa_rec coa_cur%ROWTYPE;
BEGIN
   select count(*) into Vbudgetrecords from gl_budget where cocode=:P55_
COCODE and coyear=:P55_COYEAR and
   coanature=:P55_COANATURE;
   if Vbudgetrecords = 0 then            -- Budget is not defined for the
                                            selected nature of accounts,
                                            therefore
      for coa_rec in coa_cur loop        -- fetch accounts of the selected
                                            nature from the chart of accounts
         Vcoacode := coa_rec.coacode;
         insert into gl_budget values (:P55_COCODE,:P55_
         COYEAR,Vcoacode,:P55_COANATURE,null,0,0,0,0,0,0,0,0,0,0,0,0,1);
         commit;
      end loop;

   end if;
EXCEPTION
   WHEN NO_DATA_FOUND THEN null;
END;
```

Code for user-defined budget

Last Year Budget

```
DECLARE
   Vbudgetrecords number := 0; Vcoacode varchar2(11); Vbudget_amount1
   number := 0;  Vbudget_amount2  number := 0;
   Vbudget_amount3  number := 0; Vbudget_amount4  number := 0; Vbudget_
   amount5  number := 0; Vbudget_amount6  number := 0;
   Vbudget_amount7  number := 0; Vbudget_amount8  number := 0; Vbudget_
   amount9  number := 0; Vbudget_amount10 number := 0;
   Vbudget_amount11 number := 0; Vbudget_amount12 number := 0;
   cursor coa_cur is
   select coacode from gl_coa where cocode=:P55_COCODE and coanature=:P55_
   COANATURE and coalevel=4
   order by coacode;
   coa_rec coa_cur%ROWTYPE;
BEGIN
```

```
   select count(*) into Vbudgetrecords from gl_budget where cocode=:P55_
   COCODE and coyear=:P55_COYEAR and
   coanature=:P55_COANATURE;
   if Vbudgetrecords = 0 then
      for coa_rec in coa_cur loop
         Vcoacode := coa_rec.coacode;
         SELECT budget_amount1,budget_amount2,budget_amount3,budget_
         amount4,budget_amount5,budget_amount6,
            budget_amount7,budget_amount8,budget_amount9,budget_
            amount10,budget_amount11,budget_amount12 INTO
            Vbudget_amount1,Vbudget_amount2,Vbudget_amount3,Vbudget_
            amount4,Vbudget_amount5,Vbudget_amount6,
            Vbudget_amount7,Vbudget_amount8,Vbudget_amount9,Vbudget_
            amount10,Vbudget_amount11,
            Vbudget_amount12
         FROM gl_budget where cocode=:P55_COCODE and coyear=:P55_COYEAR-1
         and coacode=Vcoacode;
         INSERT INTO gl_budget VALUES (:P55_COCODE,:P55_
         COYEAR,Vcoacode,:P55_COANATURE,null,Vbudget_amount1,
         Vbudget_amount2, Vbudget_amount3,Vbudget_amount4,Vbudget_
         amount5,Vbudget_amount6,Vbudget_amount7,
         Vbudget_amount8,Vbudget_amount9,Vbudget_amount10,Vbudget_
         amount11,Vbudget_amount12,2);
         commit;
      end loop;
   end if;
EXCEPTION
   WHEN NO_DATA_FOUND THEN null;
END;
```

Fetch last year's budget value for each financial account.

Code for last year's budget

Last Year Actual

```
DECLARE
   Vbudgetrecords number := 0;
   Vcoacode varchar2(11);
   Vpfrom date;
   Vpto   date;
   Vbalance number := 0;
   cursor coa_cur is
   select coacode from gl_coa where cocode=:P55_COCODE and coanature=:P55_
   COANATURE and coalevel=4
   order by coacode;
   coa_rec coa_cur%ROWTYPE;
BEGIN
```

```
select count(*) into Vbudgetrecords from gl_budget where cocode=
:P55_COCODE and coyear=:P55_COYEAR and
coanature=:P55_COANATURE;
if Vbudgetrecords = 0 then
   for coa_rec in coa_cur loop
      Vcoacode := coa_rec.coacode;
      for j in 1 .. 12 Loop
         select pfrom,pto into Vpfrom,Vpto from gl_fiscal_year where
         comonthid=j and cocode=:P55_COCODE and
         coyear=:P55_COYEAR-1;
         if :P55_COANATURE='Assets' or :
         P55_COANATURE='Expenses' then
            select  sum(TD.vchdr)-sum(TD.vchcr)
            into Vbalance
            from    gl_tran_master TM,
            gl_tran_detail TD
            where TM.cocode=TD.cocode and
                  TM.tran_no=TD.tran_no and
                  TM.cocode=:P55_COCODE and
                  TD.coacode=Vcoacode and
                  TM.vchdate between Vpfrom and Vpto and
                  TM.closing=0;
         end if;
         if :P55_COANATURE='Capital' or :P55_COANATURE='Liabilities' or
         :P55_COANATURE='Revenue' then
            select  sum(TD.vchcr)-sum(TD.vchdr) into Vbalance
            from    gl_tran_master TM, gl_tran_detail TD
            where TM.cocode=TD.cocode and
                        TM.tran_no=TD.tran_no and
                        TM.cocode=:P55_COCODE and
                        TD.coacode=Vcoacode and
                        TM.vchdate between Vpfrom and Vpto and
                     TM.closing=0;
         end if;
         if j=1 then
            insert into gl_budget
            (cocode,coyear,coacode,
            coanature,cccode,budget_amount1,criterion) values
            (:P55_COCODE,:P55_COYEAR,Vcoacode,
            :P55_COANATURE,null,Vbalance,3);
         elsif j=2 then
            update gl_budget set
            budget_amount2=Vbalance where cocode=:P55_COCODE and
            coyear=:P55_COYEAR and
            coacode=Vcoacode;
         elsif j=3 then
```

Usually asset and expense accounts have a debit balance; therefore, in order to get a positive value, a debit is deducted from a credit. A reverse equation is applied to capital, liabilities, and revenue accouts.

First month's budget amount (budget_amount1) is inserted, while figures for the remaining 11 months are updated on the same row.

Code for last year's actual values

```
               update gl_budget set budget_amount3=Vbalance where
               cocode=:P55_COCODE and coyear=:P55_COYEAR and
               coacode=Vcoacode;
            elsif j=4 then
               update gl_budget set budget_amount4=Vbalance where
               cocode=:P55_COCODE and coyear=:P55_COYEAR and
               coacode=Vcoacode;
            elsif j=5 then
               update gl_budget set budget_amount5=Vbalance where
               cocode=:P55_COCODE and coyear=:P55_COYEAR and
               coacode=Vcoacode;
            elsif j=6 then
               update gl_budget set budget_amount6=Vbalance where
               cocode=:P55_COCODE and coyear=:P55_COYEAR and
               coacode=Vcoacode;
            elsif j=7 then
               update gl_budget set budget_amount7=Vbalance where
               cocode=:P55_COCODE and coyear=:P55_COYEAR and
               coacode=Vcoacode;
            elsif j=8 then
               update gl_budget set budget_amount8=Vbalance where
               cocode=:P55_COCODE and coyear=:P55_COYEAR and
               coacode=Vcoacode;
            elsif j=9 then
               update gl_budget set budget_amount9=Vbalance where
               cocode=:P55_COCODE and coyear=:P55_COYEAR and
               coacode=Vcoacode;
            elsif j=10 then
               update gl_budget set budget_amount10=Vbalance where
               cocode=:P55_COCODE and coyear=:P55_COYEAR and
               coacode=Vcoacode;
            elsif j=11 then
               update gl_budget set budget_amount11=Vbalance where
               cocode=:P55_COCODE and coyear=:P55_COYEAR and
               coacode=Vcoacode;
            else
               update gl_budget set budget_amount12=Vbalance where
               cocode=:P55_COCODE and coyear=:P55_COYEAR and
               coacode=Vcoacode;
            end if;
            commit;
         end loop;
      end loop;
   end if;
EXCEPTION
   WHEN NO_DATA_FOUND THEN null;
END;
```

Chapter 26

Generate Budget Report

```
DECLARE
   Vactual number := 0;
   Vbudget number := 0;
   Vvariance number := 0;
   Vpercent number := 0;
   Vstatus varchar2(1);
   Vpfrom date;
   Vpto date;
   Vcoacode varchar2(11);
   Vcoatitle varchar2(50);
   Vcoanature varchar2(11);
   Vtotalbudget number := 0;
   Vtotalactual number := 0;
   Vtotalvariance number := 0;
   Vtotalpercent number := 0;
   VnetStatus varchar2(1);
   Vconame varchar2(50);
   VmonthName1 varchar2(9);
   VmonthName2 varchar2(9);
   VprintedOn timestamp;

   cursor budget_cur is
   select * from gl_budget where coacode between :P75_ACCOUNTFROM and :P75_
   ACCOUNTTO and
   cocode=:P75_COCODE and coyear=:P75_COYEAR order by coacode;
   budget_rec budget_cur%ROWTYPE;
BEGIN
   delete from gl_budget_report where upper(userid)=upper(:APP_USER);
   -- Delete user's existing budget report
   commit;
   select coname into Vconame from gl_company where cocode=:P75_COCODE;
   select comonthname into VmonthName1 from gl_fiscal_year where
   cocode=:P75_COCODE and
               coyear=:P75_COYEAR and comonthid=:P75_MONTHFROM;
   select comonthname into VmonthName2 from gl_fiscal_year where
   cocode=:P75_COCODE and
               coyear=:P75_COYEAR and comonthid=:P75_MONTHTO;
   select SYSDATE into VprintedOn FROM DUAL;
   for budget_rec in budget_cur loop
      Vcoacode := budget_rec.coacode;
      Vcoanature := budget_rec.coanature;
      if :P75_MONTHFROM = :P75_MONTHTO THEN     -- Report called for a
                                                   single month
   select pfrom,pto into Vpfrom,Vpto from gl_fiscal_year where
   cocode=:P75_COCODE and coyear=:P75_COYEAR and
   comonthid=:P75_MONTHFROM;
   Vbudget := 0;
   if :P75_MONTHFROM=1 then
      Vbudget := nvl(budget_rec.budget_amount1,0);
   elsif :P75_MONTHFROM=2 then
      Vbudget := nvl(budget_rec.budget_amount2,0);
   elsif :P75_MONTHFROM=3 then
      Vbudget := nvl(budget_rec.budget_amount3,0);
   elsif :P75_MONTHFROM=4 then
      Vbudget := nvl(budget_rec.budget_amount4,0);
   elsif :P75_MONTHFROM=5 then
      Vbudget := nvl(budget_rec.budget_amount5,0);
   elsif :P75_MONTHFROM=6 then
      Vbudget := nvl(budget_rec.budget_amount6,0);
   elsif :P75_MONTHFROM=7 then
      Vbudget := nvl(budget_rec.budget_amount7,0);
   elsif :P75_MONTHFROM=8 then
      Vbudget := nvl(budget_rec.budget_amount8,0);
   elsif :P75_MONTHFROM=9 then
      Vbudget := nvl(budget_rec.budget_amount9,0);
   elsif :P75_MONTHFROM=10 then
      Vbudget := nvl(budget_rec.budget_amount10,0);
   elsif :P75_MONTHFROM=11 then
      Vbudget := nvl(budget_rec.budget_amount11,0);
   else
      Vbudget := nvl(budget_rec.budget_amount12,0);
   end if;
end if;
if :P75_MONTHTO > :P75_MONTHFROM THEN   -- Report called for multiple
                                           months
   select pfrom into Vpfrom from gl_fiscal_year where cocode=:P75_
   COCODE and coyear=:P75_COYEAR and
              comonthid=:P75_MONTHFROM;
   select pto into Vpto from gl_fiscal_year where cocode=:P75_COCODE
   and coyear=:P75_COYEAR and
              comonthid=:P75_MONTHTO;
   Vbudget := 0;
   for J in :P75_MONTHFROM .. :P75_MONTHTO loop
      if J=1 then
         Vbudget := Vbudget + nvl
         (budget_rec.budget_amount1,0);
      elsif J=2 then
         Vbudget := Vbudget + nvl
         (budget_rec.budget_amount2,0);
      elsif J=3 then
```

Budget figures of all months accumulated into Vbudget variable.

```
         Vbudget := Vbudget + nvl(budget_rec.budget_amount3,0);
      elsif J=4 then
         Vbudget := Vbudget + nvl(budget_rec.budget_amount4,0);
      elsif J=5 then
         Vbudget := Vbudget + nvl(budget_rec.budget_amount5,0);
      elsif J=6 then
         Vbudget := Vbudget + nvl(budget_rec.budget_amount6,0);
      elsif J=7 then
         Vbudget := Vbudget + nvl(budget_rec.budget_amount7,0);
      elsif J=8 then
         Vbudget := Vbudget + nvl(budget_rec.budget_amount8,0);
      elsif J=9 then
         Vbudget := Vbudget + nvl(budget_rec.budget_amount9,0);
      elsif J=10 then
         Vbudget := Vbudget + nvl(budget_rec.budget_amount10,0);
      elsif J=11 then
         Vbudget := Vbudget + nvl(budget_rec.budget_amount11,0);
      else
         Vbudget := Vbudget + nvl(budget_rec.budget_amount12,0);
      end if;
   end loop;
end if;

if :P75_COANATURE='Assets' or :P75_COANATURE=
'Expenses' then
   select   sum(TD.vchdr)-sum(TD.vchcr) into Vactual
     from   gl_tran_master TM, gl_tran_detail TD
    where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
    TM.cocode=:P75_COCODE and
                 TD.coacode=Vcoacode and TM.vchdate between Vpfrom and
                 Vpto;
end if;
if :P75_COANATURE='Capital' or :P75_COANATURE='Liabilities' or
:P75_COANATURE='Revenue' then
   select   sum(TD.vchcr)-sum(TD.vchdr) into Vactual
     from   gl_tran_master TM, gl_tran_detail TD
    where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
    TM.cocode=:P75_COCODE and
                 TD.coacode=Vcoacode and TM.vchdate between
                 Vpfrom and Vpto;
end if;
select coatitle into Vcoatitle from gl_coa where coacode=Vcoacode and
cocode=:P75_COCODE;
Vvariance := Vbudget - Vactual;     -- Variance = Budgeted figures
less Actual values
if Vbudget > 0 then                 -- avoid zero division error
   Vpercent := (Vvariance/Vbudget) * 100;
```

Fetched actual values from the transaction tables.

```
      else
         Vpercent := 0;
      end if;
      if Vbudget > Vactual then
         Vstatus := 'U';
      end if;
      if Vactual > Vbudget then
         Vstatus := 'O';
      end if;
      if nvl(Vactual,0) = nvl(Vbudget,0) then
         Vstatus := '-';
      end if;                    One record inserted for each financial account

      insert into gl_budget_report values (Vcoacode,Vcoatitle,nvl(Vbudget,0)
      ,nvl(Vactual,0),nvl(Vvariance,0),
      nvl(Vpercent,0),Vstatus,upper(:APP_USER),0,Vconame,:P75_ACCOUNTFROM,
      :P75_ACCOUNTTO,VmonthName1,VmonthName2,VprintedOn);
      commit;
   end loop;
   select sum(budget) into Vtotalbudget from gl_budget_report where
   upper(userid)=upper(:APP_USER);
   select sum(actual) into Vtotalactual from gl_budget_report where
   upper(userid)=upper(:APP_USER);
   select sum(variance) into Vtotalvariance from gl_budget_report where
   upper(userid)=upper(:APP_USER);
   if Vtotalbudget > 0 then            -- avoid zero division error
      Vtotalpercent := (Vtotalvariance/Vtotalbudget) * 100;
   end if;
   if Vtotalbudget > Vtotalactual then
      Vnetstatus := 'U';
   end if;
   if Vtotalactual > Vtotalbudget then
      Vnetstatus := 'O';
   end if;
   insert into gl_budget_report values (' ','GRAND
   TOTAL',nvl(Vtotalbudget,0),nvl(Vtotalactual,0),nvl(Vtotalvariance,0),
   nvl(Vtotalpercent,0),Vnetstatus,upper(:APP_USER),1,Vconame,:P75_
   ACCOUNTFROM,
   :P75_ACCOUNTTO,VmonthName1,VmonthName2,VprintedOn);
   commit;
END;
```

Chapter 27

Check Report Code

```
DECLARE
   Vreportfound number := 0;
   Verrortext varchar2(60);
BEGIN
   if :P18_EXISTINGNEW='NEW' then
      select count(*) into Vreportfound from gl_fs_setup
      where cocode=:P18_COCODE and upper(reportcode)=upper(:P18_
REPORTCODE2);
      if Vreportfound > 0 THEN
         Verrortext := 'Report Code already exists in the database';
      end if;
      return rtrim(Verrortext);
   end if;
END;
```

Populate Report Code Value in Tabular Form

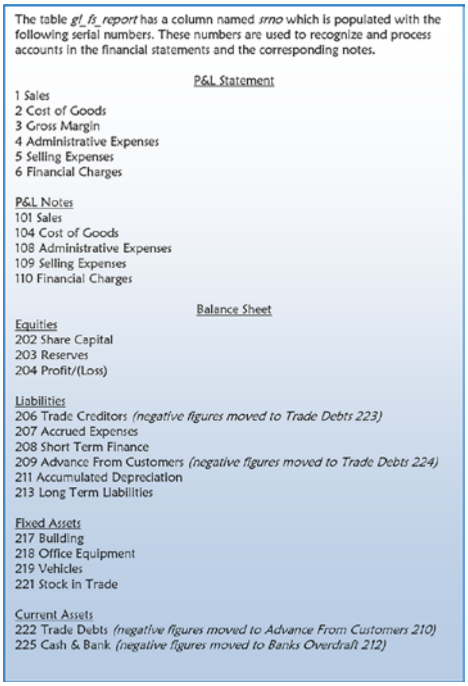
```
if :P18_EXISTINGNEW='NEW' then
   FOR i IN 1 .. apex_application.g_f02.COUNT LOOP
      apex_application.g_f03(i) := :P18_REPORTCODE2;
      apex_application.g_f04(i) := :P18_REPORTTITLE2;
   END LOOP;
else
   FOR i IN 1 .. apex_application.g_f02.COUNT LOOP
      apex_application.g_f03(i) := :P18_REPORTCODE1;
      apex_application.g_f04(i) := :P18_REPORTTITLE1;
   END LOOP;
end if;
```

Chapter 28

Generate Profit and Loss

```
DECLARE
   VreportCode varchar2(4);
   VreportTitle varchar2(50);
   Vcocode number;
   Vconame varchar2(50);
   VcurrentYear number;
   VpreviousYear number;
   VcurrentFromDate date;
   VcurrentToDate date;
   Vcomonthname varchar2(9);
   VpreviousFromDate date;
   VpreviousToDate date;
   VaccountFrom varchar2(11);
   VaccountTo varchar2(11);
   VcurrentSales number := 0;
   VpreviousSales number := 0;
   VcurrentOpeningStock number := 0;
   VpreviousOpeningStock number := 0;
   VcurrentClosingStock number := 0;
   VpreviousClosingStock number := 0;
   VcurrentCOG number := 0;
   VpreviousCOG number := 0;
   VcurrentGrossMargin number := 0;
   VpreviousGrossMargin number := 0;
   VcurrentAdmin number := 0;
   VpreviousAdmin number := 0;
   VcurrentSelling number := 0;
   VPreviousSelling number := 0;
   VcurrentFinancial number := 0;
   VpreviousFinancial number := 0;
   VcurrentProfitLoss number := 0;
   VpreviousProfitLoss number := 0;
   Vvariance number := 0;
   Vpercent number := 0;
   Vpercent2 number := 0;

-- P&L Notest Variables
   Vcoacode varchar2(11);
   vcoatitle varchar2(50);
   VcurrentBalance number := 0;
   VpreviousBalance number := 0;
   Vsrno number := 0;
```


The table *gl_fs_report* has a column named *srno* which is populated with the following serial numbers. These numbers are used to recognize and process accounts in the financial statements and the corresponding notes.

P&L Statement

1 Sales
2 Cost of Goods
3 Gross Margin
4 Administrative Expenses
5 Selling Expenses
6 Financial Charges

P&L Notes
101 Sales
104 Cost of Goods
108 Administrative Expenses
109 Selling Expenses
110 Financial Charges

Balance Sheet

Equities
202 Share Capital
203 Reserves
204 Profit/(Loss)

Liabilities
206 Trade Creditors *(negative figures moved to Trade Debts 223)*
207 Accrued Expenses
208 Short Term Finance
209 Advance From Customers *(negative figures moved to Trade Debts 224)*
211 Accumulated Depreciation
213 Long Term Liabilities

Fixed Assets
217 Building
218 Office Equipment
219 Vehicles
221 Stock in Trade

Current Assets
222 Trade Debts *(negative figures moved to Advance From Customers 210)*
225 Cash & Bank *(negative figures moved to Banks Overdraft 212)*

Generate Profit & Loss process continued...➔

```
BEGIN
   delete from gl_fs_report where upper(userid)=upper(:APP_USER);
   -- Delete existing report of the user
   commit;
   if :APP_PAGE_ID = 76 then    -- Financial Statements Page
      Vcocode := :P76_COCODE;
      Vconame := :P76_CONAME;
      VreportCode := :P76_REPORTCODE;
      VcurrentFromDate := :P76_CURRENTFROMDATE;
      VcurrentToDate := :P76_CURRENTTODATE;
      VpreviousFromDate := :P76_PREVIOUSFROMDATE;
      VpreviousToDate := :P76_PREVIOUSTODATE;
      VcurrentYear := :P76_CURRENTYEAR;
      Vcomonthname := :P76_COMONTHNAME;
   elsif :APP_PAGE_ID = 1 then    -- Desktop Dashboard
      Vcocode := :P1_COCODE;
      Vconame := null;
      VreportCode := :P1_REPORTCODE;
      VcurrentFromDate := :P1_CURRENTFROMDATE;
      VcurrentToDate := :P1_CURRENTTODATE;
      VpreviousFromDate := :P1_PREVIOUSFROMDATE;
      VpreviousToDate := :P1_PREVIOUSTODATE;
      VcurrentYear := :P1_CURRENTYEAR;
      Vcomonthname := null;
   else    -- Mobile Home Page 6
      Vcocode := :P6_COCODE;
      Vconame := :P6_CONAME;
      VreportCode := 'BS01';
      VcurrentFromDate := :P6_CURRENTFROMDATE;
      VcurrentToDate := :P6_CURRENTTODATE;
      VpreviousFromDate := :P6_PREVIOUSFROMDATE;
      VpreviousToDate := :P6_PREVIOUSTODATE;
      VcurrentYear := :P6_CURRENTYEAR;
      VcomonthName := :P6_COMONTHNAME;
   end if;
   select distinct reportTitle into VreportTitle from gl_fs_setup where
   cocode=Vcocode and reportCode=VreportCode;
```

This IF conditions evaluate which page this process was called from. Note that it is called from Financial Statements Page, Deskop, and Mobile Home Pages.

Generate Profit & Loss process continued...➔

```
-- Compute Sales
   Vpercent := 0;
   select AccountFrom,AccountTo into VaccountFrom,VaccountTo from gl_fs_
   setup
   where cocode=Vcocode and fsaccount='Sales';
   if VaccountFrom is not null and VaccountTo is not null then
```

```
      select   sum(TD.vchcr)-sum(TD.vchdr) into VcurrentSales --Current
                                                              Year's Sales
        from   gl_tran_master TM, gl_tran_detail TD
     where   TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
     TM.cocode=Vcocode and
                   TD.coacode between VaccountFrom and VaccountTo and
                   TM.vchdate between VcurrentFromDate and VcurrentToDate
                   and TM.closing=0;
      select   sum(TD.vchcr)-sum(TD.vchdr) into VpreviousSales  --Previous
                                                                Year's Sales
        from   gl_tran_master TM, gl_tran_detail TD
     where   TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
     TM.cocode=Vcocode and
                   TD.coacode between VaccountFrom and VaccountTo and
                   TM.vchdate between VpreviousFromDate and VpreviousToDate
                   and TM.closing=0;
      Vvariance := nvl(VcurrentSales,0) - nvl(VpreviousSales,0);
      if VpreviousSales <> 0 and VpreviousSales is not null then  -- To
      avoid ORA-01476: divisor is equal to zero error
         Vpercent := (Vvariance/VpreviousSales)*100;
      end if;
   end if;
   insert into gl_fs_report values (VreportCode,VreportTitle,1,'Sales',nvl(V
   currentSales,0),nvl(VpreviousSales,0),
   nvl(Vpercent,0),upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthname,0,0,0
   ,null,null,0);
   commit;

-- Compute Cost of Goods
   Vpercent := 0;
   select AccountFrom,AccountTo into VaccountFrom,VaccountTo from gl_fs_
   setup where cocode=Vcocode and
   fsaccount='Cost of Goods';
   if VaccountFrom is not null and VaccountTo is not null then
      select   sum(TD.vchdr)-sum(TD.vchcr) into VcurrentCOG      -- Current
      Year's Cost
        from   gl_tran_master TM, gl_tran_detail TD
       where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
       TM.cocode=Vcocode and
                   TD.coacode between VaccountFrom and VaccountTo and
                   TM.vchdate between VcurrentFromDate and VcurrentToDate
                   and TM.closing=0;
      select   sum(TD.vchdr)-sum(TD.vchcr) into VpreviousCOG    -- Previous
                                                                Year's Cost
        from   gl_tran_master TM, gl_tran_detail TD
     where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
     TM.cocode=Vcocode and
                  TD.coacode between VaccountFrom and VaccountTo and
                 TM.vchdate between VpreviousFromDate and VpreviousToDate
                 and TM.closing=0;
    Vvariance := nvl(VcurrentCOG,0) - nvl(VpreviousCOG,0);
    if VpreviousCOG <> 0 and VpreviousCOG is not null then
       Vpercent := (Vvariance/VpreviousCOG)*100;
    end if;
 end if;
insert into gl_fs_report values (VreportCode,VreportTitle,3,'Cost of Goods
',nvl(VcurrentCOG,0),nvl(VpreviousCOG,0),
 nvl(Vpercent,0),upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthname,0,0,0
 ,null,null,0);
 commit;

 VcurrentGrossMargin := nvl(VcurrentSales,0) - nvl(VcurrentCOG,0);
 VpreviousGrossMargin := nvl(VpreviousSales,0) - nvl(VpreviousCOG,0);
 Vvariance := nvl(VcurrentGrossMargin,0)-nvl(VpreviousGrossMargin,0);
 if VpreviousGrossMargin <> 0 and VpreviousGrossMargin is not null then
    Vpercent := (Vvariance/VpreviousGrossMargin)*100;
 end if;
 insert into gl_fs_report values (VreportCode,VreportTitle,7,'.....Gross
 Margin',nvl(VcurrentGrossMargin,0),
 nvl(VpreviousGrossMargin,0),nvl(Vpercent,0),upper(:APP_USER),Vconame,VCUR
 RENTYEAR,Vcomonthname,
 1,0,0,null,null,0);
 commit;

-- Compute Administrative Expenses
 Vpercent := 0;
 select AccountFrom,AccountTo into VaccountFrom,VaccountTo from gl_fs_
 setup where cocode=Vcocode and
 fsaccount='Admin';
 if VaccountFrom is not null and VaccountTo is not null then
    select   sum(TD.vchdr)-sum(TD.vchcr) into VcurrentAdmin
    -- Current Year's Admin Expenses
      from   gl_tran_master TM, gl_tran_detail TD
     where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
     TM.cocode=Vcocode and
                 TD.coacode between VaccountFrom and VaccountTo and
                 TM.vchdate between VcurrentFromDate and VcurrentToDate
                 and TM.closing=0;
    select   sum(TD.vchdr)-sum(TD.vchcr) into VpreviousAdmin
    -- Previous Year's Admin Expenses
      from   gl_tran_master TM, gl_tran_detail TD
      where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
      TM.cocode=Vcocode and
                  TD.coacode between VaccountFrom and VaccountTo and
                  TM.vchdate between VpreviousFromDate and VpreviousToDate
                  and TM.closing=0;
      Vvariance := nvl(VcurrentAdmin,0) - nvl(VpreviousAdmin,0);
      if VpreviousAdmin <> 0 and VpreviousAdmin is not null then
         Vpercent := (Vvariance/VpreviousAdmin)*100;
      end if;
   end if;
   insert into gl_fs_report values (VreportCode,VreportTitle,8,'Administrati
   ve Expenses',nvl(VcurrentAdmin,0),
   nvl(VpreviousAdmin,0), nvl(Vpercent,0),upper(:APP_USER),Vconame,VCURRENTY
   EAR,Vcomonthname,0,0,0,null,null,0);
   commit;

-- Compute Selling & Marketing Expenses
   Vpercent := 0;
   select AccountFrom,AccountTo into VaccountFrom,VaccountTo from gl_fs_
   setup where cocode=Vcocode and
   fsaccount='Selling';
   if VaccountFrom is not null and VaccountTo is not null then
      select   sum(TD.vchdr)-sum(TD.vchcr) into VcurrentSelling
      -- Current Year's Selling Expenses
        from   gl_tran_master TM, gl_tran_detail TD
       where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
       TM.cocode=Vcocode and
                   TD.coacode between VaccountFrom and VaccountTo and
                   TM.vchdate between VcurrentFromDate and VcurrentToDate
                   and TM.closing=0;
      select   sum(TD.vchdr)-sum(TD.vchcr) into VpreviousSelling
      -- Previous Year's Selling Expenses
        from   gl_tran_master TM, gl_tran_detail TD
       where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
       TM.cocode=Vcocode and
                    TD.coacode between VaccountFrom and VaccountTo and
                    TM.vchdate between VpreviousFromDate and VpreviousToDate
                    and TM.closing=0;
      Vvariance := nvl(VcurrentSelling,0) - nvl(VpreviousSelling,0);
      if VpreviousSelling <> 0 and VpreviousSelling is not null then
         Vpercent := (Vvariance/VpreviousSelling)*100;
      end if;
   end if;
   insert into gl_fs_report values (VreportCode,VreportTitle,9,'Selling Expe
   nses',nvl(VcurrentSelling,0),
   nvl(VpreviousSelling,0),nvl(Vpercent,0),upper(:APP_USER),Vconame,VCURRENT
   YEAR,Vcomonthname,0,0,0,null,null,0);
   commit;
```

```
-- Compute Financial Charges
   Vpercent := 0;
   select AccountFrom,AccountTo into VaccountFrom,VaccountTo from gl_fs_
   setup where cocode=Vcocode and
   fsaccount='Financial';
   if VaccountFrom is not null and VaccountTo is not null then
      select   sum(TD.vchdr)-sum(TD.vchcr) into VcurrentFinancial     --
      Current Year's Financial Expenses
        from   gl_tran_master TM, gl_tran_detail TD
       where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
       TM.cocode=Vcocode and
                   TD.coacode between VaccountFrom and VaccountTo and
                   TM.vchdate between VcurrentFromDate and VcurrentToDate
                   and TM.closing=0;
      select   sum(TD.vchdr)-sum(TD.vchcr) into VpreviousFinancial   --
      Previous Year's Financial Expenses
        from   gl_tran_master TM, gl_tran_detail TD
       where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
       TM.cocode=Vcocode and
                    TD.coacode between VaccountFrom and VaccountTo and
                    TM.vchdate between VpreviousFromDate and VpreviousToDate
                    and TM.closing=0;
      Vvariance := nvl(VcurrentFinancial,0) - nvl(VpreviousFinancial,0);
      if VpreviousFinancial <> 0 and VpreviousFinancial is not null then
         Vpercent := (Vvariance/VpreviousFinancial)*100;
      end if;
   end if;
   insert into gl_fs_report values (VreportCode,VreportTitle,10,'Financial
   Charges',nvl(VcurrentFinancial,0),
   nvl(VpreviousFinancial,0),nvl(Vpercent,0),upper(:APP_USER),Vconame,VCURRE
   NTYEAR,Vcomonthname,0,0,0,null,null,0);
   commit;

   VcurrentProfitLoss := nvl(VcurrentGrossMargin,0)-nvl(VcurrentAdmin,0)+nvl
   (VcurrentSelling,0)+nvl(VcurrentFinancial,0));
   VpreviousProfitLoss := nvl(VpreviousGrossMargin,0) - (nvl(VpreviousAdmin,
   0)+nvl(VpreviousSelling,0)
                                            +nvl(VpreviousFinancial,0));
   Vvariance := nvl(VcurrentProfitLoss,0) - nvl(VpreviousProfitLoss,0);
   if VpreviousProfitLoss <> 0 and VpreviousProfitLoss is not null then
      Vpercent := (Vvariance/VpreviousProfitLoss)*100;
   end if;
   insert into gl_fs_report values (VreportCode,VreportTitle,11,'Net Profit/
   (Loss)',nvl(VcurrentProfitLoss,0),
   nvl(VpreviousProfitLoss,0),nvl(Vpercent,0),upper(:APP_USER),Vconame,VCURR
   ENTYEAR,Vcomonthname,
   0,1,0,null,null,1);
   commit;

-- Sales Notes
   declare
      cursor sales_cur is
      select  coacode,coatitle from gl_coa
      where coacode between (select accountfrom from gl_fs_setup where
      cocode=Vcocode and reportcode=VreportCode
                and fsaccount='Sales') and (select accountto from gl_fs_
                setup where cocode=Vcocode
                and reportcode=VreportCode and fsaccount='Sales') and
                coalevel=4 and cocode=Vcocode
      order by coacode;
      sales_rec sales_cur%ROWTYPE;
   begin
      for sales_rec in sales_cur loop
         Vcoacode := sales_rec.coacode;
         Vcoatitle := sales_rec.coatitle;
         select   sum(TD.vchcr)-sum(TD.vchdr) into VcurrentBalance
         -- Current Year's Sales
           from   gl_tran_master TM, gl_tran_detail TD
          where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
          TM.cocode=Vcocode and TD.coacode = Vcoacode and
                    TM.vchdate between VcurrentFromDate and VcurrentToDate
                     and TM.closing=0;

         select   sum(TD.vchcr)-sum(TD.vchdr) into VpreviousBalance
         -- Previous Year's Sales
           from   gl_tran_master TM, gl_tran_detail TD
          where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
          TM.cocode=Vcocode and TD.coacode = Vcoacode and
                    TM.vchdate between VpreviousFromDate and
                    VpreviousToDate and TM.closing=0;
         Vvariance := nvl(VcurrentBalance,0) - nvl(VpreviousBalance,0);
         if VpreviousBalance <> 0 and VpreviousBalance is not null then
            Vpercent := (Vvariance/VpreviousBalance)*100;
         end if;
         insert into gl_fs_report values (VreportCode,VreportTitle,101,'Sale
         s',nvl(VcurrentBalance,0),nvl(VpreviousBalance,0),
         nvl(Vpercent,0),upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthname,
         0,0,1,Vcoacode,Vcoatitle,0);
         commit;
      end loop;
   end;
```

```
-- Cost of Goods Notes
   declare
      cursor cog_cur is
      select coacode,coatitle from gl_coa
      where coacode between (select accountfrom from gl_fs_setup where
      cocode=Vcocode and reportcode=VreportCode
                  and fsaccount='Cost of Goods') and (select accountto from
                  gl_fs_setup where cocode=Vcocode
                  and reportcode=VreportCode and fsaccount='Cost of Goods')
                  and coalevel=4 and cocode=Vcocode
      order by coacode;
      cog_rec cog_cur%ROWTYPE;
   begin
      for cog_rec in cog_cur loop
         Vcoacode := cog_rec.coacode;
         Vcoatitle := cog_rec.coatitle;

         select   sum(TD.vchdr)-sum(TD.vchcr) into VcurrentBalance
         -- Current Year's Cost
           from   gl_tran_master TM, gl_tran_detail TD
          where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
          TM.cocode=Vcocode and TD.coacode = Vcoacode and
                      TM.vchdate between VcurrentFromDate and VcurrentToDate
                      and TM.closing=0;

         select   sum(TD.vchdr)-sum(TD.vchcr) into VpreviousBalance
         -- Previous Year's Cost
           from   gl_tran_master TM, gl_tran_detail TD
          where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
          TM.cocode=Vcocode and TD.coacode = Vcoacode and
                      TM.vchdate between VpreviousFromDate and
                      VpreviousToDate and TM.closing=0;

         Vvariance := nvl(VcurrentBalance,0) - nvl(VpreviousBalance,0);
         if VpreviousBalance <> 0 and VpreviousBalance is not null then
            Vpercent := (Vvariance/VpreviousBalance)*100;
         end if;
         insert into gl_fs_report values (VreportCode,VreportTitle,104,'Cost
         of Goods',nvl(VcurrentBalance,0),
         nvl(VpreviousBalance,0),nvl(Vpercent,0),upper(:APP_USER),Vconame,VC
         URRENTYEAR,Vcomonthname,0,0,1,
         Vcoacode,Vcoatitle,0);
         commit;
      end loop;
   end;
```

```
-- Administrative Expenses Notes
   Declare
      cursor admin_cur is
      select coacode,coatitle from gl_coa
      where coacode between (select accountfrom from gl_fs_setup where
      cocode=Vcocode and reportcode=VreportCode
                  and fsaccount='Admin') and (select accountto from gl_fs_
                  setup where cocode=Vcocode
                  and reportcode=VreportCode and fsaccount='Admin') and
                  coalevel=4 and cocode=Vcocode
      order by coacode;
      admin_rec admin_cur%ROWTYPE;
   begin
      for admin_rec in admin_cur loop
         Vcoacode := admin_rec.coacode;
         Vcoatitle := admin_rec.coatitle;
         select   sum(TD.vchdr)-sum(TD.vchcr) into VcurrentBalance
         -- Current Year
           from   gl_tran_master TM, gl_tran_detail TD
          where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
          TM.cocode=Vcocode and TD.coacode = Vcoacode and
                      TM.vchdate between VcurrentFromDate and VcurrentToDate
                      and TM.closing=0;

         select   sum(TD.vchdr)-sum(TD.vchcr) into VpreviousBalance
         -- Previous Year
           from   gl_tran_master TM, gl_tran_detail TD
          where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
          TM.cocode=Vcocode and TD.coacode = Vcoacode and
                      TM.vchdate between VpreviousFromDate and
                      VpreviousToDate and TM.closing=0;

         Vvariance := nvl(VcurrentBalance,0) - nvl(VpreviousBalance,0);
         if VpreviousBalance <> 0 and VpreviousBalance is not null then
            Vpercent := (Vvariance/VpreviousBalance)*100;
         end if;
         insert into gl_fs_report values (VreportCode,VreportTitle,108,'Admi
         nistrative Expenses',nvl(VcurrentBalance,0),
         nvl(VpreviousBalance,0),nvl(Vpercent,0),upper(:APP_USER),Vconame,VC
         URRENTYEAR,Vcomonthname,0,0,1,
         Vcoacode,Vcoatitle,0);
         commit;
      end loop;
   end;
```

```
-- Selling Expenses Notes
   declare
      cursor selling_cur is
      select coacode,coatitle from gl_coa
      where coacode between (select accountfrom from gl_fs_setup where
      cocode=Vcocode and reportcode=VreportCode
                  and fsaccount='Selling') and (select accountto from gl_fs_
                  setup where cocode=Vcocode
                  and reportcode=VreportCode and fsaccount='Selling') and
                  coalevel=4 and cocode=Vcocode
      order by coacode;
      selling_rec selling_cur%ROWTYPE;
   begin
      for selling_rec in selling_cur loop
         Vcoacode := selling_rec.coacode;
         Vcoatitle := selling_rec.coatitle;
         select   sum(TD.vchdr)-sum(TD.vchcr) into VcurrentBalance
         -- Current Year
           from   gl_tran_master TM, gl_tran_detail TD
          where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
           TM.cocode=Vcocode and TD.coacode = Vcoacode and
                      TM.vchdate between VcurrentFromDate and VcurrentToDate
                      and TM.closing=0;

         select   sum(TD.vchdr)-sum(TD.vchcr) into VpreviousBalance
         -- Previous Year
           from   gl_tran_master TM, gl_tran_detail TD
          where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
          TM.cocode=Vcocode and TD.coacode = Vcoacode and
                      TM.vchdate between VpreviousFromDate and
                      VpreviousToDate and TM.closing=0;

         Vvariance := nvl(VcurrentBalance,0) - nvl(VpreviousBalance,0);
         if VpreviousBalance <> 0 and VpreviousBalance is not null then
            Vpercent := (Vvariance/VpreviousBalance)*100;
         end if;
         insert into gl_fs_report values (VreportCode,VreportTitle,109,'Sell
         ing Expenses',nvl(VcurrentBalance,0),
         nvl (VpreviousBalance,0),nvl(Vpercent,0),upper(:APP_USER),Vconame,V
         CURRENTYEAR,Vcomonthname,
         0,0,1,Vcoacode,Vcoatitle,0);
         commit;
      end loop;
   end;
```

```
-- Financial Charges
   declare
      cursor financial_cur is
      select coacode,coatitle from gl_coa
      where coacode between (select accountfrom from gl_fs_setup where
      cocode=Vcocode and reportcode=VreportCode
            and fsaccount='Financial') and (select accountto from
gl_fs_setup where cocode=Vcocode
            and reportcode=VreportCode and fsaccount='Financial') and
            coalevel=4 and cocode=Vcocode
      order by coacode;
      financial_rec financial_cur%ROWTYPE;
   begin
      for financial_rec in financial_cur loop
         Vcoacode := financial_rec.coacode;
         Vcoatitle := financial_rec.coatitle;
         select   sum(TD.vchdr)-sum(TD.vchcr) into VcurrentBalance
         -- Current Year
           from   gl_tran_master TM, gl_tran_detail TD
        where   TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
        TM.cocode=Vcocode and TD.coacode = Vcoacode and
                    TM.vchdate between VcurrentFromDate and VcurrentToDate
                   and TM.closing=0;

         select   sum(TD.vchdr)-sum(TD.vchcr) into VpreviousBalance
         -- Previous Year
           from   gl_tran_master TM, gl_tran_detail TD
          where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
          TM.cocode=Vcocode and TD.coacode = Vcoacode and
                    TM.vchdate between VpreviousFromDate and
                    VpreviousToDate and TM.closing=0;

         Vvariance := nvl(VcurrentBalance,0) - nvl(VpreviousBalance,0);
         if VpreviousBalance <> 0 and VpreviousBalance is not null then
            Vpercent := (Vvariance/VpreviousBalance)*100;
         end if;
         insert into gl_fs_report values (VreportCode,VreportTitle,110,'Fina
         ncial Charges',nvl(VcurrentBalance,0),
         nvl(VpreviousBalance,0),nvl(Vpercent,0),upper(:APP_USER),Vconame,VC
         URRENTYEAR,Vcomonthname,
         0,0,1,Vcoacode,Vcoatitle,0);
         commit;
      end loop;
   end;
```

```
-- P&L Account Balances For Desktop and Mobile Home pages
   if :APP_PAGE_ID = 1 or :APP_PAGE_ID = 6 then         -- Desktop dashboard
                                                        or mobile home page
      declare
         VaccountTitle varchar2(50);
         cursor pl_cur is
         select srno,currentbalance,previousbalance
         from gl_fs_report
         where upper(userid)=upper(:APP_USER)
         order by srno;
         pl_rec pl_cur%ROWTYPE;
      begin
         delete from gl_dashboard where upper(userid)=upper(:APP_USER);
         commit;
         for pl_rec in pl_cur loop
            Vsrno := pl_rec.srno;
            VcurrentYear := pl_rec.currentBalance;
            VpreviousYear := pl_rec.previousBalance;
            if Vsrno=1 then
               VaccountTitle := 'Sales';
            elsif Vsrno=3 then
               VaccountTitle := 'Cost of Goods';
            elsif Vsrno=7 then
               VaccountTitle := 'Gross Margin';
            elsif Vsrno=8 then
               VaccountTitle := 'Administrative Expenses';
            elsif Vsrno=9 then
               VaccountTitle := 'Selling Expenses';
            elsif Vsrno=10 then
               VaccountTitle := 'Financial Charges';
            else
               VaccountTitle := 'Net Profit/(Loss)';
            end if;
            insert into gl_dashboard values (Vsrno,VaccountTitle,VcurrentYea
            r,VpreviousYear,upper(:APP_USER),null,null,null);
            commit;
         end loop;
      end;

-- P&L Ratio
      declare
         VcurrentGP number; VpreviousGP number; VcurrentNP number;
         VpreviousNP number; VcurrentOP number;
         VpreviousOP number; VcurrentGPratio number; VpreviousGPratio
         number; VcurrentOPratio number;
         VpreviousOPratio number; VcurrentNPratio number; VpreviousNPratio
         number;
      begin
-- Gross Profit
         select currentYear,previousYear into VcurrentGP,VpreviousGP from
         gl_dashboard
         where srno=7 and upper(userid)=upper(:APP_USER);
-- Net Sales
         select currentYear,previousYear into VcurrentSales,VpreviousSales
         from gl_dashboard
         where srno=1 and upper(userid)=upper(:APP_USER);
-- Admin Expenses
         select currentYear,previousYear into VcurrentAdmin,VpreviousAdmin
         from gl_dashboard
         where srno=8 and upper(userid)=upper(:APP_USER);
-- Selling Expenses
         select currentYear,previousYear into VcurrentSelling,VpreviousSelli
         ng from gl_dashboard
         where srno=9 and upper(userid)=upper(:APP_USER);
-- Net Profit
         select currentYear,previousYear into VcurrentNP,VpreviousNP from
         gl_dashboard
         where srno=11 and upper(userid)=upper(:APP_USER);

-- Calculate Operating Profit
         VcurrentOP  := (VcurrentGP-(VcurrentAdmin+VcurrentSelling));
         VpreviousOP := (VpreviousGP-(VpreviousAdmin+VpreviousSelling));
-- Calculate GP Ratios
         VcurrentGPratio := (VcurrentGP/VcurrentSales) * 100;
         VpreviousGPratio := (VpreviousGP/VpreviousSales) * 100;
-- Calculate OP Ratios
         VcurrentOPratio := VcurrentOP/VcurrentSales * 100;
         VpreviousOPratio := VpreviousOP/VpreviousSales * 100;
-- Calculate NP Ratios
         VcurrentNPratio := VcurrentNP/VcurrentSales * 100;
         VpreviousNPratio := VpreviousNP/VpreviousSales * 100;

         insert into gl_dashboard values (50,'-',VcurrentGP,VpreviousGP,upp
         er(:APP_USER),
         'Gross Profit Ratio',VcurrentGPratio,VpreviousGPratio);
         insert into gl_dashboard values (52,'-',VcurrentOP,VpreviousOP,upp
         er(:APP_USER),
         'Operating Profit Ratio',VcurrentOPratio,VpreviousOPratio);
         insert into gl_dashboard values (53,'-',VcurrentNP,VpreviousNP,upp
         er(:APP_USER),
         'Net Profit Ratio',VcurrentNPratio,VpreviousNPratio);
         commit;
      end;
   end if;
```

```
-- The REDIRECT_URL procedure of the APEX_UTIL package below redirects to
the page from where this application process
    was called
   if :APP_PAGE_ID = 76 then        -- Financial Statements Report
      apex_util.redirect_url (p_url => 'f?p=&APP_ID.:76:&SESSION.');
   elsif :APP_PAGE_ID = 1 then     -- Desktop Dashboard
      apex_util.redirect_url (p_url => 'f?p=&APP_ID.:1:&SESSION.');
   else                                                 -- Mobile Home Page 6
      apex_util.redirect_url (p_url => 'f?p=&APP_ID.:6:&SESSION.');
   end if;
END;
```

Generate Balance Sheet

```
DECLARE
   VreportCode varchar2(4);
   VreportTitle varchar2(50);
   Vcocode number;
   Vconame varchar2(50);
   VcurrentYear number;
   VpreviousYear number;
   VcurrentFromDate date;
   VcurrentToDate date;
   Vcomonthname varchar2(9);
   VpreviousFromDate date;
   VpreviousToDate date;
   VaccountFrom varchar2(11);
   VaccountTo varchar2(11);
   VcurrentSales number := 0;
   VpreviousSales number := 0;
   VcurrentOpeningStock number := 0;
   VpreviousOpeningStock number := 0;
   VcurrentClosingStock number := 0;
   VpreviousClosingStock number := 0;
   VcurrentCOG number := 0;
   VpreviousCOG number := 0;
   VcurrentGrossMargin number := 0;
   VpreviousGrossMargin number := 0;
   VcurrentAdmin number := 0;
   VpreviousAdmin number := 0;
   VcurrentSelling number := 0;
   VPreviousSelling number := 0;
   VcurrentFinancial number := 0;
   VpreviousFinancial number := 0;
   VcurrentProfitLoss number := 0;
   VpreviousProfitLoss number := 0;
   Vvariance number := 0;
   Vpercent number := 0;
   Vpercent2 number := 0;
   Vcoacode varchar2(11);
   vcoatitle varchar2(50);
   VcurrentBalance number := 0;
   VpreviousBalance number := 0;
   Vsrno number := 0;
   Vrecords number := 0;
   VfsAccount varchar2(50);
   VcurrentPL number := 0;
   VpreviousPL number := 0;
   VCURRENTMONTH number(2) := 0;
   VTESTVALUE NUMBER := 0;
   Vnotes number := 0;
   VnotesCode varchar2(11);

-- Balance Sheet Notes
BEGIN
  if :APP_PAGE_ID = 76 then
      Vcocode := :P76_COCODE;
      Vconame := :P76_CONAME;
      VreportCode := :P76_REPORTCODE;
      VcurrentToDate := :P76_CURRENTTODATE;
      VpreviousToDate := :P76_PREVIOUSTODATE;
      VcurrentYear := :P76_CURRENTYEAR;
      VCURRENTMONTH := :P76_CURRENTMONTH;
      VcomonthName := :P76_COMONTHNAME;
   elsif :APP_PAGE_ID = 1 then      -- Desktop Dashboard
      Vcocode := :P1_COCODE;
      Vconame := null;
      VreportCode := :P1_REPORTCODE;
      VcurrentToDate := :P1_CURRENTTODATE;
      VpreviousToDate := :P1_PREVIOUSTODATE;
      VcurrentYear := :P1_CURRENTYEAR;
      VCURRENTMONTH := :P1_CURRENTMONTH;
      VcomonthName := null;
   else     -- Mobile Home Page 6
      Vcocode := :P6_COCODE;
      Vconame := :P6_CONAME;
      VreportCode := 'BS01';
      VcurrentToDate := :P6_CURRENTTODATE;
      VpreviousToDate := :P6_PREVIOUSTODATE;
      VcurrentYear := :P6_CURRENTYEAR;
      VCURRENTMONTH := :P6_CURRENTMONTH;
      VcomonthName := :P6_COMONTHNAME;
   end if;
```

```
declare
   cursor fs_cur is
   select fsAccount,AccountFrom,AccountTo
   from gl_fs_setup
   where reportcode=VreportCode;
   fs_rec fs_cur%ROWTYPE;
begin
   select count(*) into Vrecords from gl_fs_setup where
   reportcode=VreportCode;
   if Vrecords > 0 then
      for fs_rec in fs_cur loop
         VfsAccount := fs_rec.fsAccount;
         VaccountFrom := fs_rec.AccountFrom;
         VaccountTo := fs_rec.AccountTo;
         Declare
            Vcoacode varchar2(11);
            vcoatitle varchar2(50);
            VcurrentBalance number := 0;
            VpreviousBalance number := 0;
            VinsertSwitch number := 0;
            VclosingEntry number := 0;

            cursor coa_cur is
            select coacode,coatitle
            from gl_coa
            where coacode between VaccountFrom and VaccountTo and
            coalevel=4 and cocode=Vcocode
            order by coacode;
            coa_rec coa_cur%ROWTYPE;
         Begin
            for coa_rec in coa_cur loop
               VinsertSwitch := 0;
               Vcoacode := coa_rec.coacode;
               Vcoatitle := coa_rec.coatitle;

-- Equities & Liabilities
               if VfsAccount='Share Capital' or VfsAccount='Reserves' or
               VfsAccount='Profit/(Loss)' or
                  VfsAccount='Trade Creditors' or VfsAccount='Accrued
                  Expenses' or VfsAccount='Short Term Finance' or
                  VfsAccount='Advance From Customers' or
                  VfsAccount='Accumulated Depreciation' or
                  VfsAccount='Banks Overdrafts' or VfsAccount='Long Term
                  Liabilities' then
                  if VfsAccount='Profit/(Loss)' then
                     VclosingEntry := 0;
      select count(*) into VclosingEntry from gl_tran_
      master
      where closing=1 and cocode=Vcocode and
     coyear=VCURRENTYEAR;
      if VclosingEntry = 0 then
         select   sum(TD.vchcr)-sum(TD.vchdr) into
         VcurrentBalance    -- Current Year
           from   gl_tran_master TM, gl_tran_detail TD
        where   TM.cocode=TD.cocode and TM.tran_no=TD.
       tran_no and TM.cocode=Vcocode and
                      TD.coacode=Vcoacode and TM.vchdate
                      <= VcurrentToDate;
      else
         if VCURRENTMONTH = 12 then -- Exclude calculated
        P&L value if it is the last month because the last
        month
            carries the closing entry with P&L figures.
            update gl_fs_report set currentBalance=0 where
            fsAccount like '%Profit/(Loss)%' and
            upper(userid)=upper(:APP_USER) and
            reportCode=VreportCode;
            commit;
         end if;
         select sum(TD.vchcr)-sum(TD.vchdr) into
         VcurrentBalance    -- Current Year
           from gl_tran_master TM, gl_tran_detail TD
        where TM.cocode=TD.cocode and TM.tran_no=TD.tran_
        no and TM.cocode=Vcocode and
                    TD.coacode = Vcoacode and TM.vchdate
                    <= VcurrentToDate;
      end if;
      if VCURRENTMONTH = 12 then
         update gl_fs_report set previousBalance=0 where
         fsAccount like '%Profit/(Loss)%' and
         upper(userid)=upper(:APP_USER) and
         reportCode=VreportCode;
         commit;
      end if;
      select   sum(TD.vchcr)-sum(TD.vchdr) into
      VpreviousBalance   -- Previous Year
      from     gl_tran_master TM, gl_tran_detail TD
       where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no
       and TM.cocode=Vcocode and
                   TD.coacode = Vcoacode and TM.vchdate
                   <= VpreviousToDate;
   else   -- Other than Profit/(Loss) account
      select   sum(TD.vchcr)-sum(TD.vchdr) into
      VcurrentBalance    -- Current Year
      from    gl_tran_master TM, gl_tran_detail TD
   where    TM.cocode=TD.cocode and TM.tran_no=TD.tran_no
   and TM.cocode=Vcocode and
                   TD.coacode = Vcoacode and TM.vchdate
                   <= VcurrentToDate;
    select    sum(TD.vchcr)-sum(TD.vchdr) into
    VpreviousBalance   -- Previous Year
     from     gl_tran_master TM, gl_tran_detail TD
  where     TM.cocode=TD.cocode and TM.tran_no=TD.tran_no
 and TM.cocode=Vcocode and
                  TD.coacode = Vcoacode and TM.vchdate <=
                  VpreviousToDate;

  end if;
  if VfsAccount = 'Share Capital' then
     insert into gl_fs_report values (VreportCode,VreportTi
     tle,202,'.......Share Capital',nvl(VcurrentBalance,0),
     nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,V
     CURRENTYEAR,Vcomonthname,
     0,0,1,Vcoacode,Vcoatitle,0);
  end if;

  if VfsAccount = 'Reserves' then
     insert into gl_fs_report values (VreportCode,Vrepor
     tTitle,203,'.......Reserves',nvl(VcurrentBalance,0),
     nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,V
     CURRENTYEAR,Vcomonthname,
     0,0,1,Vcoacode,Vcoatitle,0);
 end if;

 if VfsAccount = 'Profit/(Loss)' then
    insert into gl_fs_report values (VreportCode,VreportTit
    le,204,'.......Profit/(Loss)',nvl(VcurrentBalance,0),
     nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,V
     CURRENTYEAR,Vcomonthname,
     0,0,1,Vcoacode,Vcoatitle,0);
end if;

if VfsAccount = 'Trade Creditors' then
   if nvl(VcurrentBalance,0) >= 0 and
   nvl(VpreviousBalance,0) >= 0 then
      insert into gl_fs_report values (VreportCode,Vrepo
      rtTitle,206,'.......Trade Creditors',nvl(VcurrentB
      alance,0),
      nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,
      VCURRENTYEAR,Vcomonthname,
      0,0,1,Vcoacode,Vcoatitle,0);
   end if;
   if VcurrentBalance >= 0 and VpreviousBalance < 0 then
      insert into gl_fs_report values (VreportCode,Vrepor
      tTitle,206,'.......Trade Creditors',nvl(VcurrentBal
      ance,0),
      0,0,upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthna
      me,0,0,1,Vcoacode,Vcoatitle,0);
   end if;
   if VcurrentBalance < 0 and VpreviousBalance >= 0 then
      nsert into gl_fs_report values (VreportCode,VreportT
      itle,206,'.......Trade Creditors',0,
      nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,V
      CURRENTYEAR,Vcomonthname,0,0,1,


      Vcoacode,Vcoatitle,0);
   end if;
   if VcurrentBalance < 0 then
      VcurrentBalance := VcurrentBalance-
      (VcurrentBalance * 2);
      insert into gl_fs_report values (VreportCode,VreportT
      itle,223,'.......Trade Debts',nvl(VcurrentBalance,0),
      0,0,upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthna
      me,0,0,1,Vcoacode,Vcoatitle,0);
      VinsertSwitch := 1;
   end if;
   if VpreviousBalance < 0 then
      VpreviousBalance := VpreviousBalance-
      (VpreviousBalance * 2);
      if VinsertSwitch = 0 then
         insert into gl_fs_report values (VreportCode,Vre
         portTitle,223,'.......Trade Debts',0,nvl(Vprevio
         usBalance,0),
         0,upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthn
         ame,0,0,1,Vcoacode,Vcoatitle,0);
      else
         update gl_fs_report set previousBalance =
         VpreviousBalance
         where srno=223 and upper(userid)=upper(:APP_
         USER);
      end if;
   end if;
end if;
```

Negative balances of Trade Creditors moved to Trade Debts section.

```
if VfsAccount = 'Accrued Expenses' then
   insert into gl_fs_report values (VreportCode,VreportTit
   le,207,'.......Accrued Expenses',nvl(VcurrentBalance,0),
   nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,VCUR
   RENTYEAR,Vcomonthname,
   0,0,1,Vcoacode,Vcoatitle,0);
end if;
if VfsAccount = 'Short Term Finance' then
   insert into gl_fs_report values (VreportCode,VreportTi
   tle,208,'.......Short Term Finance',nvl(VcurrentBalan
   ce,0),
   nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,VCUR
   RENTYEAR,Vcomonthname,
   0,0,1,Vcoacode,Vcoatitle,0);
end if;
if VfsAccount = 'Advance From Customers' then
   if nvl(VcurrentBalance,0) >= 0 and
   nvl(VpreviousBalance,0) >= 0 then
      insert into gl_fs_report values (VreportCode,Vreport
      Title,209,'.......Advance From Customers',
      nvl(VcurrentBalance,0),nvl(VpreviousBalance,0),0,upp
      er(:APP_USER),Vconame,VCURRENTYEAR,
      Vcomonthname,0,0,1,Vcoacode,Vcoatitle,0);
   end if;
   if VcurrentBalance >= 0 and VpreviousBalance < 0 then
      insert into gl_fs_report values (VreportCode,Vreport
      Title,209,'.......Advance From Customers',
      nvl(VcurrentBalance,0),0,0,upper(:APP_
      USER),Vconame,VCURRENTYEAR,
      Vcomonthname,0,0,1,Vcoacode,Vcoatitle,0);
   end if;
   if VcurrentBalance < 0 and VpreviousBalance >= 0 then
      insert into gl_fs_report values (VreportCode,Vreport
      Title,209,'.......Advance From Customers',0,
      nvl(VpreviousBalance,0),0,upper(:APP_
      USER),Vconame,VCURRENTYEAR,
      Vcomonthname,0,0,1,Vcoacode,Vcoatitle,0);
   end if;
   if VcurrentBalance < 0 then
      VcurrentBalance := VcurrentBalance-
      (VcurrentBalance * 2);
      insert into gl_fs_report values (VreportCode,Vrepo
     rtTitle,224,'.......Trade Debts',nvl(VcurrentBalan
     ce,0),
      0,0,upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthna
      me,0,0,1,Vcoacode,Vcoatitle,0);
```

```
       VinsertSwitch := 1;
```

Negative balanes of Customer Advances moved to Trade Debts section.

```
       end if;
       if VpreviousBalance < 0 then
          VpreviousBalance := VpreviousBalance-
          (VpreviousBalance * 2);
          if VinsertSwitch = 0 then
             insert into gl_fs_report values (VreportCode,Vrep
             ortTitle,224,'.......Trade Debts',0,
             nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconam
             e,VCURRENTYEAR,Vcomonthname,
             0,0,1,Vcoacode,Vcoatitle,0);
          else
            update gl_fs_report set previousBalance =
            VpreviousBalance
             where srno=224 and upper(userid)=upper(:APP_
             USER);
          end if;
       end if;
    end if;
    if VfsAccount = 'Accumulated Depreciation' then
       insert into gl_fs_report values (VreportCode,VreportTit
       le,211,'.......Accumulated Depreciation',
       nvl(VcurrentBalance,0),nvl(VpreviousBalance,0),0,upper
       (:APP_USER),
       Vconame,VCURRENTYEAR,Vcomonthname,0,0,1,Vcoacode,Vcoat
       itle,0);
    end if;
    if VfsAccount = 'Long Term Liabilities' then
       insert into gl_fs_report values (VreportCode,VreportTit
       le,213,'.......Long Term Liabilities',
       nvl(VcurrentBalance,0),nvl(VpreviousBalance,0),0,upper(
       :APP_USER),Vconame,VCURRENTYEAR,
       Vcomonthname,0,0,1,Vcoacode,Vcoatitle,0);
    end if;
    commit;

 end if;

 if VfsAccount='Building' or VfsAccount='Office Equipment' or
 VfsAccount='Vehicles' or VfsAccount='Stock in Trade'
or VfsAccount='Trade Debts' or VfsAccount='Cash and Bank' then
    select   sum(TD.vchdr)-sum(TD.vchcr) into VcurrentBalance
    -- Current Year
      from   gl_tran_master TM, gl_tran_detail TD
 where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
 TM.cocode=Vcocode and
             TD.coacode = Vcoacode and TM.vchdate <=
             VcurrentToDate;

select   sum(TD.vchdr)-sum(TD.vchcr) into VpreviousBalance
-- Previous Year
  from   gl_tran_master TM, gl_tran_detail TD
 where TM.cocode=TD.cocode and TM.tran_no=TD.tran_no and
TM.cocode=Vcocode and
             TD.coacode = Vcoacode and TM.vchdate <=
             VpreviousToDate;

if VfsAccount = 'Building' then
   insert into gl_fs_report values (VreportCode,VreportTit
   le,217,'.......Building',nvl(VcurrentBalance,0),
   nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,VCUR
   RENTYEAR,Vcomonthname,
   0,0,1,Vcoacode,Vcoatitle,0);
end if;
if VfsAccount = 'Office Equipment' then
   insert into gl_fs_report values (VreportCode,VreportT
   itle,218,'.......Office Equipment',nvl(VcurrentBalan
   ce,0),
   nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,VCUR
   RENTYEAR,Vcomonthname,
   0,0,1,Vcoacode,Vcoatitle,0);
end if;
if VfsAccount = 'Vehicles' then
   insert into gl_fs_report values (VreportCode,VreportTit
   le,219,'.......Vehicles',nvl(VcurrentBalance,0),
   nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,VCUR
   RENTYEAR,Vcomonthname,
   0,0,1,Vcoacode,Vcoatitle,0);
end if;
if VfsAccount = 'Stock in Trade' then
   insert into gl_fs_report values (VreportCode,VreportTi
   tle,221,'.......Stock in Trade',nvl(VcurrentBalance,0),
   nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,VCUR
   RENTYEAR,Vcomonthname,
   0,0,1,Vcoacode,Vcoatitle,0);
end if;
if VfsAccount = 'Trade Debts' then
   if nvl(VcurrentBalance,0) >= 0 and
   nvl(VpreviousBalance,0) >= 0 then
      insert into gl_fs_report values (VreportCode,Vrepo
      rtTitle,222,'.......Trade Debts',nvl(VcurrentBalan
      ce,0),
           nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,V
           CURRENTYEAR,Vcomonthname,
           0,0,1,Vcoacode,Vcoatitle,0);
        end if;
        if VcurrentBalance >= 0 and VpreviousBalance < 0 then
           insert into gl_fs_report values (VreportCode,Vrepo
           rtTitle,222,'.......Trade Debts',nvl(VcurrentBalan
           ce,0),
           0,0,upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthna
           me,0,0,1,Vcoacode,Vcoatitle,0);
        end if;
        if VcurrentBalance < 0 and VpreviousBalance >= 0 then
           insert into gl_fs_report values (VreportCode,Vrepor
           tTitle,222,'.......Trade Debts',0,nvl(VpreviousBala
           nce,0),
           0,upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthname
           ,0,0,1,Vcoacode,Vcoatitle,0);


end if;
if VcurrentBalance < 0 then
           VcurrentBalance := VcurrentBalance-
           (VcurrentBalance * 2);
           insert into gl_fs_report values (VreportCode,Vreport
           Title,210,'.......Advance From Customers',
           nvl(VcurrentBalance,0),0,0,upper(:APP_USER),Vconame,
           VCURRENTYEAR,Vcomonthname,
           0,0,1,Vcoacode,Vcoatitle,0);
           VinsertSwitch := 1;
        end if;

        if VpreviousBalance < 0 then
           VpreviousBalance := VpreviousBalance-
           (VpreviousBalance * 2);
           if VinsertSwitch = 0 then
              insert into gl_fs_report values (VreportCode,Vr
              eportTitle,210,'.......Advance From Customers',0,
              nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconam
              e,VCURRENTYEAR,Vcomonthname,
              0,0,1,Vcoacode,Vcoatitle,0);
           else
              update gl_fs_report set previousBalance =
              VpreviousBalance
              where srno=210 and upper(userid)=upper
             (:APP_USER);
           end if;
```

Negative Trade Debt balances moved to Advance From Customers section.

```
   end if;
end if;

if VfsAccount = 'Cash and Bank' then
   if nvl(VcurrentBalance,0) >= 0 and
   nvl(VpreviousBalance,0) >= 0 then
      insert into gl_fs_report values (Vrepor
      tCode,VreportTitle,225,'.......Cash and
      Bank',nvl(VcurrentBalance,0),
      nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconame,V
      CURRENTYEAR,Vcomonthname,
      0,0,1,Vcoacode,Vcoatitle,0);
   end if;
   if VcurrentBalance >= 0 and VpreviousBalance < 0 then
      insert into gl_fs_report values (Vrepor
      tCode,VreportTitle,225,'.......Cash and
      Bank',nvl(VcurrentBalance,0),
      0,0,upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthna
      me,0,0,1,Vcoacode,Vcoatitle,0);
   end if;
   if VcurrentBalance < 0 and VpreviousBalance >= 0 then
      insert into gl_fs_report values (VreportCode,Vrepor
      tTitle,225,'.......Cash and Bank',0,nvl(VpreviousBa
      lance,0),
      0,upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthname
      ,0,0,1,Vcoacode,Vcoatitle,0);
   end if;
   if VcurrentBalance < 0 then
      VcurrentBalance := VcurrentBalance-
     (VcurrentBalance * 2);
      insert into gl_fs_report values (VreportCode,Vrepor
      tTitle,212,'.......Banks Overdrafts',nvl(VcurrentBa
      lance,0),
      0,0,upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthna
      me,0,0,1,Vcoacode,Vcoatitle,0);


      VinsertSwitch := 1;
```

Negative Bank balances moved to Bank Overdrafts section.

```
   end if;
   if VpreviousBalance < 0 then
      VpreviousBalance := VpreviousBalance-
      (VpreviousBalance * 2);
      if VinsertSwitch = 0 then
         insert into gl_fs_report values (VreportCode,Vrep
         ortTitle,212,'.......Banks Overdrafts',0,
         nvl(VpreviousBalance,0),0,upper(:APP_USER),Vconam
         e,VCURRENTYEAR,Vcomonthname,
         0,0,1,Vcoacode,Vcoatitle,0);
      else
```

```
                          update gl_fs_report set previousBalance =
                          VpreviousBalance
                          where srno=212 and upper(userid)=upper(:APP_
                         USER);
                       end if;
                    end if;
                 end if;
                 commit;
              end if;
           end loop;
        End;
     end loop;

-- Incorporate current Profit/(Loss) into Balance Sheet
     if VreportCode like 'BS%' then
        select currentBalance,previousBalance into VcurrentPL,VpreviousPL
        from gl_fs_report
        where fsAccount='Net Profit/(Loss)' and upper(userid)=upper(:APP_
       USER);
        insert into gl_fs_report values (VreportCode,VreportTit
        le,204,'.......Profit/(Loss)',nvl(VcurrentPL,0),nvl(VpreviousPL,0),
        0,upper(:APP_USER),Vconame,VCURRENTYEAR,Vcomonthname,0,0,1,null,nu
        ll,0);
        commit;
     end if;

     delete from gl_fs_report where currentbalance=0 and previousbalance=0;
     if :APP_PAGE_ID=76 and VreportCode like 'BS%' then
        delete from gl_fs_report where srno < 200 and
        upper(userid)=upper(:APP_USER);
        commit;
     end if;
     update gl_fs_report set srno=209 where srno=210 and
     upper(userid)=upper(:APP_USER);
     update gl_fs_report set srno=222 where srno=223 or srno=224 and
     upper(userid)=upper(:APP_USER);
     commit;

    end if;
  end;

-- Club Balance Sheet Accounts
  declare
     cursor fs_report_cur is
     select   srno,fsaccount,sum(currentbalance) currentbalance,sum(previou
     sbalance) previousbalance
```

```
      from    gl_fs_report
      where reportcode = VreportCode and upper(userid) = upper(:APP_USER)
      group by srno,fsaccount
      order by srno;
      fs_report_rec fs_report_cur%ROWTYPE;
   begin
      select distinct reportTitle into VreportTitle from gl_fs_setup where
      cocode=Vcocode and reportCode=VreportCode;
      if VreportCode like 'BS%' then
         for fs_report_rec in fs_report_cur loop
            Vsrno := fs_report_rec.srno;
            VfsAccount := fs_report_rec.fsAccount;
            VcurrentBalance := fs_report_rec.currentBalance;
            VpreviousBalance := fs_report_rec.previousBalance;
            insert into gl_fs_report values
            (VreportCode,VreportTitle,Vsrno,VfsAccount,VcurrentBalance,Vprev
            iousBalance,0,upper(:APP_USER),
             VCONAME,VCURRENTYEAR,VCOMONTHNAME,0,0,0,null,null,0);
            commit;
         end loop;
      end if;
   end;
```

```
-- Calculate Balance Sheet Variance/Percentage
   declare
      cursor fs_report_cur is
      select   srno,fsaccount,currentbalance,previousbalance,notes,notescode
      from    gl_fs_report
      where reportcode = :P76_REPORTCODE and upper(userid) = upper(:APP_
      USER)
      order by srno;
      fs_report_rec fs_report_cur%ROWTYPE;
   begin
      for fs_report_rec in fs_report_cur loop
            Vsrno := fs_report_rec.srno;
            VfsAccount := fs_report_rec.fsAccount;
            VcurrentBalance := fs_report_rec.currentBalance;
            VpreviousBalance := fs_report_rec.previousBalance;
            Vnotes := fs_report_rec.notes;
            VnotesCode := fs_report_rec.notesCode;
            Vvariance := VcurrentBalance - VpreviousBalance;
            if VpreviousBalance <> 0 then
               Vpercent := (Vvariance/VpreviousBalance) * 100;
            else
               Vpercent := 0;
            end if;
            if Vnotes=1 then
               update gl_fs_report set percent=Vpercent where srno=Vsrno and
               notes=Vnotes and notescode=VnotesCode
               and reportCode=:P76_REPORTCODE and upper(userid)=upper(:APP_
               USER);
            else
               update gl_fs_report set percent=Vpercent where srno=Vsrno and
               notes=0 and reportCode=:P76_REPORTCODE
               and upper(userid)=upper(:APP_USER);
            end if;
            commit;
      end loop;
   end;

-- Insert Balance Sheet Headings & Grant Totals
   declare
      VcurrentCapital number := 0;
      VpreviousCapital number := 0;
      VcurrentAsset number := 0;
      VpreviousAsset number := 0;
   begin
      IF :P76_REPORTCODE Like 'BS%' then
         select sum(currentbalance) into VcurrentCapital
         from gl_fs_report
         where reportcode = :P76_REPORTCODE and upper(userid) = upper(:APP_
         USER) and srno between 202 and 213
         and notes=0;

         select sum(previousbalance) into VpreviousCapital
         from gl_fs_report
         where reportcode = :P76_REPORTCODE and upper(userid) = upper(:APP_
         USER) and srno between 202 and 213
         and notes=0;

         select sum(currentbalance) into VcurrentAsset
         from gl_fs_report
         where reportcode = :P76_REPORTCODE and upper(userid) = upper(:APP_
         USER) and srno between 217 and 225
         and notes=0;

         select sum(previousbalance) into VpreviousAsset
         from gl_fs_report
         where reportcode = :P76_REPORTCODE and upper(userid) = upper(:APP_
         USER) and srno between 217 and 225
         and notes=0;
```

```
        insert into gl_fs_report values (:P76_REPORTCODE,VreportTitle,201,'
        CAPITAL AND LIABILITIES',null,null,null,upper
        (:APP_USER),:P76_CONAME,:P76_CURRENTYEAR,:P76_COMONTHNAME,0,0,0,nu
        ll,null,1);

        insert into gl_fs_report values (:P76_REPORTCODE,VreportTitle,205,'
        LIABILITIES',null,null,null,upper
        (:APP_USER),:P76_CONAME,:P76_CURRENTYEAR,:P76_COMONTHNAME,0,0,0,nu
        ll,null,1);

        insert into gl_fs_report values (:P76_REPORTCODE,VreportTitle,214,
        'TOTAL CAPITAL AND
        LIABILITIES',VcurrentCapital,VpreviousCapital,0,upper(:APP_
        USER),:P76_CONAME,:P76_CURRENTYEAR,
        :P76_COMONTHNAME,0,1,0,null,null,1);

        insert into gl_fs_report values (:P76_REPORTCODE,VreportTitle,215,'
        ASSETS',null,null,null,upper(:APP_USER),
        :P76_CONAME,:P76_CURRENTYEAR,:P76_COMONTHNAME,0,0,0,null,null,1);

        insert into gl_fs_report values (:P76_
        REPORTCODE,VreportTitle,216,'...FIXED ASSETS',null,null,null,
        upper(:APP_USER),:P76_CONAME,:P76_CURRENTYEAR,:P76_COMONTHNAME,0,0
        ,0,null,null,1);

        insert into gl_fs_report values (:P76_
        REPORTCODE,VreportTitle,220,'...CURRENT ASSETS',null,null,null,
        upper(:APP_USER),:P76_CONAME,:P76_CURRENTYEAR,:P76_COMONTHNAME,0,0
        ,0,null,null,1);

        insert into gl_fs_report values (:P76_REPORTCODE,VreportTitle,226,'
        TOTAL ASSETS',VcurrentAsset,VpreviousAsset,0,
        upper(:APP_USER),:P76_CONAME,:P76_CURRENTYEAR,:P76_COMONTHNAME,0,1
        ,0,null,null,1);
        commit;
     end if;
  end;


-- Balance Sheet Ratios
  if :APP_PAGE_ID = 1 or :APP_PAGE_ID = 6 then        -- Desktop dashboard
                                                      or mobile home page
     declare
        VcurrentCA number;
        VpreviousCA number;
        VcurrentCL number;
        VpreviousCL number;
```

```
         VcurrentQCA number;
         VpreviousQCA number;
         Vcurrent_CurrentRatio number;
         Vprevious_CurrentRatio number;
         Vcurrent_NWC number;
         Vprevious_NWC number;
         Vcurrent_QuickRatio number;
         Vprevious_QuickRatio number;
      begin
-- Current Assets
         select sum(currentBalance), sum(previousBalance) into VcurrentCA,
         VpreviousCA from gl_fs_report
         where notes=0 and (srno=221 or srno=222 or srno=225);
-- Current Liabilities
         select sum(currentBalance), sum(previousBalance) into VcurrentCL,
         VpreviousCL from gl_fs_report
         where notes=0 and (srno=206 or srno=207 or srno=208 or srno=209 or
        srno=211 or srno=212);
-- Quick Current Assets
         select sum(currentBalance), sum(previousBalance) into VcurrentQCA,
         VpreviousQCA from gl_fs_report
         where notes=0 and (srno=222 or srno=225);
-- Current Ratio
         Vcurrent_CurrentRatio := VcurrentCA / VcurrentCL;
         Vprevious_CurrentRatio := VpreviousCA / VpreviousCL;
-- Net Working Capital
         Vcurrent_NWC := VcurrentCA - VcurrentCL;
         Vprevious_NWC := VpreviousCA - VpreviousCL;
-- Quick Ratio
         Vcurrent_QuickRatio := VcurrentQCA / VcurrentCL;
         Vprevious_QuickRatio := VpreviousQCA / VpreviousCL;
         insert into gl_dashboard values (60,'Current Assets',VcurrentCA,Vpr
         eviousCA,upper(:APP_USER),
         'Current Ratio',Vcurrent_CurrentRatio,Vprevious_CurrentRatio);
         insert into gl_dashboard values (61,'Current Liabilities',VcurrentC
         L,VpreviousCL,upper(:APP_USER),
         'Current Liabilities',1,1);
         insert into gl_dashboard values (62,'Net Working Capital',Vcurrent_
         NWC,Vprevious_NWC,upper(:APP_USER),
         'Net Working Capital',Vcurrent_NWC,Vprevious_NWC);
         insert into gl_dashboard values (63,'Quick Current Assets',Vcurrent
         QCA,VpreviousQCA,upper(:APP_USER),
         'Quick Ratio',Vcurrent_QuickRatio,Vprevious_QuickRatio);
         commit;
      end;
   end if;
-- The REDIRECT_URL procedure of the APEX_UTIL package below redirects to
the page from where this application process
```

```
    was called
   if :APP_PAGE_ID = 76 then -- Financial Statements Report
      apex_util.redirect_url (p_url => 'f?p=&APP_ID.:76:&SESSION.');
   elsif :APP_PAGE_ID = 1 then -- Desktop Dashboard
      apex_util.redirect_url (p_url => 'f?p=&APP_ID.:1:&SESSION.');
   else -- Mobile Home Page 6
      apex_util.redirect_url (p_url => 'f?p=&APP_ID.:6:&SESSION.');
   end if;
END;
```

Index

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