Oracle® Projects APIs, Client Extensions, and Open Interfaces

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Oracle Projects APIs, Client Extensions, and Open Interfaces Reference, Release 12

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- Do you need different information or graphics? If so, where, and in what format?
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Preface

Intended Audience

Welcome to Release 12 of the *Oracle Projects APIs, Client Extensions, and Open Interfaces Reference.*

This guide contains the information you need to implement, maintain, and use the APIs, client extensions, and open interfaces that are available when you use Oracle Projects.

See Related Information Sources on page xix for more Oracle Applications product information.

TTY Access to Oracle Support Services

Oracle provides dedicated Text Telephone (TTY) access to Oracle Support Services within the United States of America 24 hours a day, seven days a week. For TTY support, call 800.446.2398.

Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Accessibility standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For more information, visit the Oracle Accessibility Program Web site at http://www.oracle.com/accessibility/ .

Accessibility of Code Examples in Documentation

Screen readers may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, some screen readers may not always read a line of text that consists solely of a bracket or brace.

Accessibility of Links to External Web Sites in Documentation

This documentation may contain links to Web sites of other companies or organizations that Oracle does not own or control. Oracle neither evaluates nor makes any representations regarding the accessibility of these Web sites.

Structure

1 Overview of Oracle Projects APIs, Client Extensions, and Open Interfaces

This chapter contains an overview of the APIs, Client Extensions, and Open Interfaces that are provided with the Oracle Projects applications.

2 Introduction to Oracle Projects APIs

This chapter contains an introduction to the Oracle Projects APIs. It describes security requirements, error messages, and standard API parameters.

3 Oracle Project Foundation APIs

This chapter describes how to implement APIs for:

- Project and task information
- Structure information
- Resource list and resource list member information
- Dependency information
- Task Assignment information

4 Oracle Project Costing APIs

This chapter describes how to implement APIs that interface and assign assets from external systems.

5 Oracle Project Billing APIs

This chapter describes how to implement APIs for:

- Agreements and funding
- Events

6 Oracle Project Management APIs

This chapter describes how to implement Oracle Project Management APIs.

7 Overview of Client Extensions

This chapter describes everything you need to know about designing and writing client extensions in Oracle Projects.

8 Oracle Project Foundation Client Extensions

This chapter describes the client extensions in the Oracle Project Foundation application.

9 Oracle Project Costing Client Extensions

This chapter describes the client extensions in the Oracle Project Costing application.

10 Oracle Project Billing Client Extensions

This chapter describes the client extensions in the Oracle Project Billing application.

11 Oracle Project Resource Management Client Extensions

This chapter describes the client extensions in the Oracle Project Resource Management application.

12 Oracle Project Management Client Extensions

This chapter describes the client extensions in the Oracle Project Management application.

13 Oracle Projects Open Interfaces

This chapter describes the open interfaces in the Oracle Projects applications.

Related Information Sources

You can choose from many sources of information, including online documentation, training, and support services, to increase your knowledge and understanding of Oracle Projects.

Integration Repository

The Oracle Integration Repository is a compilation of information about the service endpoints exposed by the Oracle E-Business Suite of applications. It provides a complete catalog of Oracle E-Business Suite's business service interfaces. The tool lets users easily discover and deploy the appropriate business service interface for integration with any system, application, or business partner.

The Oracle Integration Repository is shipped as part of the E-Business Suite. As your instance is patched, the repository is automatically updated with content appropriate for the precise revisions of interfaces in your environment.

Online Documentation

Oracle Applications documentation, including online help patches (HTML) and guides (PDF), is available on Oracle *MetaLink*.

Guides Related to All Products

Oracle Applications User's Guide

This guide explains how to enter data, query, run reports, and navigate using the graphical user interface (GUI) available with this release of Oracle Projects (and any other Oracle Applications products). This guide also includes information on setting user profiles, as well as running and reviewing reports and concurrent programs.

You can access this user's guide online by choosing "Getting Started with Oracle Applications" from any Oracle Applications help file.

Oracle Projects Documentation Set

Oracle Projects Implementation Guide

Use this manual as a guide for implementing Oracle Projects. This manual also includes appendixes covering function security, menus and responsibilities, and profile options.

Oracle Projects Fundamentals

Oracle Project Fundamentals provides the common foundation shared across the Oracle Projects products (Project Costing, Project Billing, Project Resource Management, Project Management, and Project Portfolio Analysis). Use this guide to learn fundamental information about the Oracle Projects solution.

This guide includes a Navigation Paths appendix. Use this appendix to find out how to access each window in the Oracle Projects solution.

Oracle Project Billing User Guide

This guide shows you how to use Oracle Project Billing to define revenue and invoicing rules for your projects, generate revenue, create invoices, and integrate with other Oracle Applications to process revenue and invoices, process client invoicing, and measure the profitability of your contract projects.

Oracle Project Costing User Guide

Use this guide to learn detailed information about Oracle Project Costing. Oracle Project Costing provides the tools for processing project expenditures, including calculating their cost to each project and determining the GL accounts to which the costs are posted.

Oracle Project Management User Guide

This guide shows you how to use Oracle Project Management to manage projects through their lifecycles -- from planning, through execution, to completion.

Oracle Project Portfolio Analysis User Guide

This guide contains the information you need to understand and use Oracle Project Portfolio Analysis. It includes information about project portfolios, planning cycles, and metrics for ranking and selecting projects for a project portfolio.

Oracle Project Resource Management User Guide

This guide provides you with information on how to use Oracle Project Resource Management. It includes information about staffing, scheduling, and reporting on project resources.

Oracle Projects Glossary

This glossary provides definitions of terms that are shared by all Oracle Projects applications. If you are unsure of the meaning of a term you see in an Oracle Projects guide, please refer to the glossary for clarification. You can find the glossary in the online help for Oracle Projects, and in the Oracle Projects Fundamentals book.

User Guides Related to This Product

Oracle Assets User Guide

This guide provides you with information on how to implement and use Oracle Assets. Use this guide to understand the implementation steps required for application use, including defining depreciation books, depreciation method, and asset categories. It also contains information on setting up assets in the system, maintaining assets, retiring and reinstating assets, depreciation, group depreciation, accounting and tax accounting, budgeting, online inquiries, impairment processing, and Oracle Assets reporting. This guide also includes a comprehensive list of profile options that you can set to customize application behavior.

Oracle Business Intelligence System Implementation Guide

This guide provides information about implementing Oracle Business Intelligence (BIS) in your environment.

Oracle Financials Implementation Guide

This guide provides you with information on how to implement the Oracle Financials E-Business Suite. It guides you through setting up your organizations, including legal entities, and their accounting, using the Accounting Setup Manager. It covers intercompany accounting and sequencing of accounting entries, and it provides examples.

Oracle General Ledger Implementation Guide

This guide provides information on how to implement Oracle General Ledger. Use this guide to understand the implementation steps required for application use, including how to set up Accounting Flexfields, Accounts, and Calendars.

Oracle General Ledger User's Guide

This guide provides you with information on how to use Oracle General Ledger. Use this guide to learn how to create and maintain ledgers, ledger currencies, budgets, and journal entries. This guide also includes information about running financial reports.

Oracle Grants Accounting User Guide

This guide provides you with information about how to implement and use Oracle Grants Accounting. Use this guide to understand the implementation steps required for application use, including defining award types, award templates, allowed cost schedules, and burden set up. This guide also explains how to use Oracle Grants Accounting to track grants and funded projects from inception to final reporting.

Oracle HRMS Documentation Set

This set of guides explains how to define your employees, so you can give them operating unit and job assignments. It also explains how to set up an organization (operating unit). Even if you do not install Oracle HRMS, you can set up employees and organizations using Oracle HRMS windows. Specifically, the following manuals will help you set up employees and operating units:

- **Oracle HRMS Enterprise and Workforce Management Guide**

  This user guide explains how to set up and use enterprise modeling, organization management, and cost analysis.

- **Managing People Using Oracle HRMS**

  Use this guide to find out about entering employees.

Oracle Internet Expenses Implementation and Administration Guide

This book explains in detail how to configure Oracle Internet Expenses and describes its integration with other applications in the E-Business Suite, such as Oracle Payables and Oracle Projects. Use this guide to understand the implementation steps required for application use, including how to set up policy and rate schedules, credit card policies, audit automation, and the expenses spreadsheet. This guide also includes detailed information about the client extensions that you can use to extend Oracle Internet Expenses functionality.

Oracle Inventory User Guide

If you install Oracle Inventory, refer to this manual to learn how to define project-related inventory transaction types and how to enter transactions in Oracle Inventory. This manual also describes how to transfer transactions from Oracle Inventory to Oracle General Ledger.

Oracle Payables Implementation Guide

This guide provides you with information on how to implement Oracle Payables. Use this guide to understand the implementation steps required for how to set up suppliers, payments, accounting, and tax.

Oracle Payables User's Guide

This guide describes how to use Oracle Payables to create invoices and make payments. In addition, it describes how to enter and manage suppliers, import invoices using the Payables open interface, manage purchase order and receipt matching, apply holds to invoices, and validate invoices. It contains information on managing expense reporting, procurement cards, and credit cards. This guide also explains the accounting for Payables transactions.

Oracle Payments Implementation Guide

This guide describes how Oracle Payments, as the central payment engine for the Oracle E-Business Suite, processes transactions, such as invoice payments from Oracle Payables, bank account transfers from Oracle Cash Management, and settlements against credit cards and bank accounts from Oracle Receivables. This guide also describes how Oracle Payments is integrated with financial institutions and payment systems for receipt and payment processing, known as funds capture and funds disbursement, respectively. Additionally, the guide explains to the implementer how to plan the implementation of Oracle Payments, how to configure it, set it up, test transactions, and how to use it with external payment systems.

Oracle Project Manufacturing Implementation Manual

Oracle Project Manufacturing allows your company to associate manufacturing costs and inventory with a project and task. Use this manual as your first source of information if you are implementing Oracle Project Manufacturing.

Oracle Property Manager Implementation Guide

Use this guide to learn how to implement Oracle Property Manager and perform basic setup steps such as setting system options and creating lookup codes, contacts, milestones, grouping rules, term templates, and a location hierarchy. This guide also describes the setup steps that you must complete in other Oracle applications before you can use Oracle Property Manager.

Oracle Property Manager User Guide

Use this guide to learn how to use Oracle Property Manager to create and administer properties, space assignments, and lease agreements.

Oracle Public Sector Advanced Features User Guide

Oracle Public Sector Advanced Features is an overlay of features that extend the existing functionality of Oracle Financials for the specific needs of the Public Sector. This guide provides information about setting up and using Oracle Public Sector Advanced Features. These features include multi-fund accounts receivable, encumbrance reconciliation reports, Governmental Accounting Standards Board (GASB) 34/35 asset accounting, enhanced funds available inquiry, the Funds Available Detail report, and the Funds Check API.

Oracle Purchasing User's Guide

This guide describes how to create and approve purchasing documents, including requisitions, different types of purchase orders, quotations, RFQs, and receipts. This guide also describes how to manage your supply base through agreements, sourcing rules, and approved supplier lists. In addition, this guide explains how you can automatically create purchasing documents based on business rules through integration with Oracle Workflow technology, which automates many of the key procurement processes.

Oracle Receivables User Guide

This guide provides you with information on how to use Oracle Receivables. Use this guide to learn how to create and maintain transactions and bills receivable, enter and apply receipts, enter customer information, and manage revenue. This guide also includes information about accounting in Receivables. Use the Standard Navigation Paths appendix to find out how to access each Receivables window.

Oracle Subledger Accounting Implementation Guide

This guide provides setup information for Oracle Subledger Accounting features, including the Accounting Methods Builder. You can use the Accounting Methods Builder to create and modify the setup for subledger journal lines and application accounting definitions for Oracle subledger applications. This guide also discusses the reports available in Oracle Subledger Accounting and describes how to inquire on subledger journal entries.

Oracle Time & Labor Implementation and User Guide

This guide describes how to capture work patterns such as shift hours so that this information can be used by other applications such as Oracle General Ledger and Oracle Projects.

BIS User Guide Online Help

This guide is provided as online help only from the BIS application and includes information about intelligence reports, Discoverer workbooks, and the Performance Management Framework.

Installation and System Administration

Oracle Applications Concepts

This guide provides an introduction to the concepts, features, technology stack, architecture, and terminology for Oracle Applications. It is a useful first book to read before installing Oracle Applications.

Installing Oracle Applications

This guide provides instructions for managing the installation of Oracle Applications products. Much of the installation process is handled using Oracle Rapid Install, which minimizes the time to install Oracle Applications and the technology stack by automating many of the required steps. This guide contains instructions for using Oracle Rapid Install and lists the tasks you need to perform to finish your installation. You should use this guide in conjunction with individual product user's guides and implementation guides.

Oracle Applications Upgrade Guide: Release 11*i* to Release 12

Refer to this guide if you are upgrading your Oracle Applications Release 11*i* products to Release 12. This guide describes the upgrade process and lists database and product-specific upgrade tasks. You must be at Release 11*i* to upgrade to Release 12. You cannot upgrade to Release 12 directly from releases prior to 11*i*.

Maintaining Oracle Applications

Use this guide to help you run the various AD utilities, such as AutoUpgrade, AutoPatch, AD Administration, AD Controller, AD Relink, License Manager, and others. It contains how-to steps, screenshots, and other information that you need to run the AD utilities. This guide also provides information on maintaining the Oracle Applications file system and database.

Oracle Applications System Administrator's Guide

This guide provides planning and reference information for the Oracle Applications System Administrator. It contains information on how to define security, customize menus and online help, and manage concurrent programs.

Oracle Alert User's Guide

This guide explains how to define periodic and event alerts to monitor the status of your Oracle Applications data.

Oracle Applications Developer's Guide

This guide contains the coding standards followed by the Oracle Applications development staff. It describes the Oracle Application Object Library components needed to implement the Oracle Applications user interface described in the *Oracle Applications User Interface Standards for Forms-Based Products*. It also provides information to help you build your custom Oracle Forms Developer forms so that they integrate with Oracle Applications.

Other Implementation Documentation

Multiple Organizations in Oracle Applications

This guide describes how to set up and use Oracle Projects with Oracle Applications' Multiple Organization support feature, so you can define and support different organization structures when running a single installation of Oracle Projects.

Oracle Workflow Administrator's Guide

This guide explains how to complete the setup steps necessary for any Oracle Applications product that includes workflow-enabled processes, as well as how to monitor the progress of runtime workflow processes.

Oracle Workflow Developer's Guide

This guide explains how to define new workflow business processes and customize existing Oracle Applications-embedded workflow processes. It also describes how to define and customize business events and event subscriptions.

Oracle Workflow User's Guide

This guide describes how Oracle Applications users can view and respond to workflow notifications and monitor the progress of their workflow processes.

Oracle Workflow API Reference

This guide describes the APIs provided for developers and administrators to access Oracle Workflow.

Oracle Applications Flexfields Guide

This guide provides flexfields planning, setup and reference information for the Oracle Projects implementation team, as well as for users responsible for the ongoing

maintenance of Oracle Applications product data. This manual also provides information on creating custom reports on flexfields data.

Oracle eTechnical Reference Manuals

Each eTechnical Reference Manual (eTRM) contains database diagrams and a detailed description of database tables, forms, reports, and programs for a specific Oracle Applications product. This information helps you convert data from your existing applications and integrate Oracle Applications data with non-Oracle applications, and write custom reports for Oracle Applications products. Oracle eTRM is available on Oracle *MetaLink*.

Oracle Applications User Interface Standards for Forms-Based Products

This guide contains the user interface (UI) standards followed by the Oracle Applications development staff. It describes the UI for the Oracle Applications products and tells you how to apply this UI to the design of an application built by using Oracle Forms.

Oracle Manufacturing APIs and Open Interfaces Manual

This manual contains up-to-date information about integrating with other Oracle Manufacturing applications and with your other systems. This documentation includes APIs and open interfaces found in Oracle Manufacturing.

Oracle Order Management Suite APIs and Open Interfaces Manual

This manual contains up-to-date information about integrating with other Oracle Manufacturing applications and with your other systems. This documentation includes APIs and open interfaces found in Oracle Order Management Suite.

Training and Support

Training

Oracle offers a complete set of training courses to help you and your staff master Oracle Projects and reach full productivity quickly. These courses are organized into functional learning paths, so you take only those courses appropriate to your job or area of responsibility.

You have a choice of educational environments. You can attend courses offered by Oracle University at any of our many Education Centers, you can arrange for our trainers to teach at your facility, or you can use Oracle Learning Network (OLN), Oracle University's online education utility. In addition, Oracle training professionals can tailor standard courses or develop custom courses to meet your needs. For example, you may want to use your organization structure, terminology, and data as examples in a customized training session delivered at your own facility.

Support

From on-site support to central support, our team of experienced professionals provides the help and information you need to keep Oracle Projects working for you. This team includes your Technical Representative, Account Manager, and Oracle's large staff of consultants and support specialists with expertise in your business area, managing an Oracle server, and your hardware and software environment.

Do Not Use Database Tools to Modify Oracle Applications Data

Oracle STRONGLY RECOMMENDS that you never use SQL*Plus, Oracle Data Browser, database triggers, or any other tool to modify Oracle Applications data unless otherwise instructed.

Oracle provides powerful tools you can use to create, store, change, retrieve, and maintain information in an Oracle database. But if you use Oracle tools such as SQL*Plus to modify Oracle Applications data, you risk destroying the integrity of your data and you lose the ability to audit changes to your data.

Because Oracle Applications tables are interrelated, any change you make using an Oracle Applications form can update many tables at once. But when you modify Oracle Applications data using anything other than Oracle Applications, you may change a row in one table without making corresponding changes in related tables. If your tables get out of synchronization with each other, you risk retrieving erroneous information and you risk unpredictable results throughout Oracle Applications.

When you use Oracle Applications to modify your data, Oracle Applications automatically checks that your changes are valid. Oracle Applications also keeps track of who changes information. If you enter information into database tables using database tools, you may store invalid information. You also lose the ability to track who has changed your information because SQL*Plus and other database tools do not keep a record of changes.

Part 1

OVERVIEW

1

Overview of Oracle Projects APIs, Client Extensions, and Open Interfaces

This chapter contains an overview of the APIs, Client Extensions, and Open Interfaces that are provided with the Oracle Projects applications.

This chapter covers the following topics:

- Overview of Oracle Projects APIs, Client Extensions, and Open Interfaces

Overview of Oracle Projects APIs, Client Extensions, and Open Interfaces

Oracle Projects integration tools are powerful, flexible tools that enable you to capture data from other Oracle applications or your own applications, define necessary format conversions, and direct data to Oracle Projects.

Oracle Projects applications provide application programming interfaces (APIs), client extensions, and open interfaces that enable you to:

- Import legacy data into Oracle Applications
- Link Oracle Projects with external applications that you build, applications on other computers, and even the applications of your suppliers and customers
- Extend the functionality of Oracle Projects to conform with your business

Oracle Projects APIs

Application programming interfaces (APIs) are procedures that perform individual functions, such as creating a project based on information in an external system. The public APIs can be employed by users of Oracle Projects to integrate Oracle Projects with external systems.

APIs are called by programs that you write. You cannot modify the code within the APIs.

Details about the Oracle Projects APIs are provided in Section II, Oracle Projects Application Programming Interfaces (APIs).

Oracle Projects Client Extensions

Client extensions are procedures that you can modify to extend the functionality of Oracle Projects for your business needs. Each client extension procedure performs a specific task, such as deriving raw cost amounts for labor transactions.

You can modify the code of client extensions to automate your company's business rules.

Details about the Oracle Projects client extensions are provided in Section III, Oracle Projects Client Extensions.

Oracle Projects Open Interfaces

An open interface is a public API that enables you to migrate data from an external system using an interface within the product.

Oracle Projects provides the Transaction Import open interface, which enables you to load transactions from external cost collection systems into Oracle Projects.

Details about the Transaction Import are provided in Section III, Oracle Projects Open Interfaces.

Part 2

ORACLE PROJECTS APIS

2

Introduction to Oracle Projects APIs

This chapter contains an introduction to the Oracle Projects APIs. It describes security requirements, error messages, and standard API parameters.

This chapter covers the following topics:

- Introduction to Oracle Projects APIs
- Overview of the Oracle Projects APIs
- Integrating Your External System with Oracle Projects
- Security Requirements
- Handling Error Messages
- Standard API Parameters
- Common APIs
- Controlling Actions in Oracle Projects
- Using API Procedures

Introduction to Oracle Projects APIs

You can use the Oracle Projects APIs to integrate an external system (for example, a project management system) with Oracle Projects.

> **Note:** Some of these APIs were previously documented as Activity Management Gateway APIs. The Activity Management Gateway productis no longer licensed. All of the APIs formerly packaged as the Activity Management Gateway are described in this manual.

This section provides you with the information you need to understand the structure and processing of the public Application Programming Interfaces (APIs) provided with Oracle Projects.

This chapter provides the following information:

- **Overview of the Oracle Projects APIs.** This section describes some of the ways that you can use the public APIs in Oracle Projects to integrate Oracle Projects with external management systems.

- **Integrating an External System with Oracle Projects.** Follow the steps in this section carefully. A properly integrated system ensures that your external system can access the Oracle Projects database and that your Oracle Applications users can obtain the privileges necessary to use the application programming interfaces (APIs) discussed in this manual.

- **Security Requirements.** Follow the steps in this section to ensure proper security when users access Oracle Projects data from an external system.

- **Handling Error Messages.** This section describes how Oracle Projects APIs create error messages, and how to display them in an external application.

- **Standard API Parameters.** This section describes the standard input and output parameters shared by most of the public APIs in Oracle Projects.

- **Common APIs.** This section provides details about APIs (GET_MESSAGES, GET_DEFAULTS, and GET_ACCUM_PERIOD_INFO) that are available for use in all Oracle Projects APIs.

Overview of the Oracle Projects APIs

The Oracle Projects Application Programming Interfaces (APIs) enable you to integrate Oracle Projects with third-party systems to build a complete management tool. You can combine the functionality of your preferred system with the features of Oracle Projects, and then safely share data and exchange information.

The APIs include more than 150 application programming interfaces that:

- Perform real-time or batch sharing of data between your system and Oracle Projects, thereby eliminating duplicate data entry

- Share business rules and workflow from one system to the other

- Share setup, project planning, resource planning, budgeting, actuals, and progress data

Detailed descriptions of the APIs are provided in the detail chapters for each Oracle Projects application.

Applications of the Oracle Projects APIs

The Oracle Projects APIs are generic tools that you can use to integrate Oracle Projects with many types of external or third-party systems, including:

- **Collaborative project planning and scheduling systems.** Integrate your enterprise business systems with team-oriented project planning and scheduling tools to provide communication links throughout your company.

- **Sales management systems.** Enter your sales order using a sales management system and call APIs to create a project in Oracle Projects based on the order information.

- **Work management systems.** Use the Oracle Projects APIs to tailor a comprehensive solution that includes your work management system. Companies in the utilities industry commonly use this type of system.

- **Customer asset management and plant maintenance systems.** Share information about work orders, tasks, assets, crew labor charges, and inventory transactions charged to a project.

- **Project manufacturing systems.** Join inventory, manufacturing, and financial applications using the APIs, as Oracle's project manufacturing solution does.

Where Information Originates

The Oracle Projects APIs make two-way communication possible between Oracle Projects and a third-party external system. For example, if a purchase order issued against a task is being processed within your enterprise, you can restrict that project's task so it can't be deleted from a desktop project management system. (For more information about restricting certain actions, see: Controlling Actions in Oracle Projects, page 2-30.)

The following table illustrates the types of information that originates in Oracle Projects:

Information That Originates in Oracle Projects	Comments
Project templates with Quick Entry (overridable) fields	You can override some of the template's default values when you create a project.
Resources	
Organizations	
Calendars (both GL and PA periods)	
Estimate to Complete (planned for a future release)	

Information That Originates in Oracle Projects	Comments
Actuals: cost amounts (raw and burdened), commitments (raw and burdened), quantities, revenue, PA or GL period, inception-to-date, period-to-date	Oracle Projects acts as the central repository of all project actuals, maintains common business rules (such as transaction controls), and collects a wide variety of transactions. Such transactions include phone usage records, labor, depreciation, commitments, usages, and expenses. Oracle Projects also performs complex cost burdening, generates revenue, and sends summarized information to external systems.

The following table illustrates the types of information that originates in an external system (in this case, a project management system).

Information That Originates in Your Project Management System	Comments
Projects and tasks of the work breakdown structure (WBS)	
Budgets: Types, Time-Phased, Amounts, Quantities, Baseline	Project managers can enter and baseline budgets from their preferred project management system or from Oracle Projects. Accounting personnel can enter budgets directly into Oracle Projects. Both types of employees can draft and update their own budget versions. Budgets created using project management systems integrate with Oracle Projects' budget calculation extensions.
Schedules and schedule changes	
Task parent reassignment	You can reassign a task to a different parent task as long the reassigned task remains under the same top task.
Percent complete: project level, WBS (any level)	Once you send this information to Oracle Projects, you can use billing extensions to produce progress billings. You can view this information in Oracle Projects using the project status inquiry (PSI) client extension.

Information That Originates in Your Project Management System	Comments
Earned value progress reporting: Budgeted Cost of Work Scheduled, Budgeted Cost of Work Performed, Actual Cost of Work Performed, Budget at Completion	You can use earned value reporting to determine cost variance, schedule variance, and variance at completion. To view this information in Oracle Projects, use the PSI client extension.

Integrating Your External System with Oracle Projects

After you install and implement Oracle Projects, you can integrate your external system with Oracle Projects. Follow the steps below to ensure that your external system can access the Oracle Projects database and that your Oracle Applications users can obtain the privileges necessary to use the APIs discussed throughout this manual.

Step 1: Create a Database Role

Create a special database role and assign it to anyone who will use the Oracle Projects APIs. You need to perform this step only once for each database, regardless of the number of users. Users can define their own role names. Oracle Projects provides the script *paamgcrole.sql* to create and assign these database roles. The script resides in the $PA_TOP/sql directory on the server and creates an output file called *paamgcrole.lst*. Run the script from any directory in which you have write privileges. You run this script as any user, such as SYSTEM or SYS with Create Role and Grant privileges on Oracle Projects Public APIs and Views.

The script requires the following arguments:

- New database role name, such as PMXFACE
- Username for the Oracle Applications user account, such as APPS

From a SQL*Plus session, use the following syntax to run the script:

```
start $PA_TOP/sql/paamgcrole.sql &role &un_apps
```

For example, to create the role PMXFACE in the APPS account, enter:

```
start $PA_TOP/sql/paamgcrole.sql PMXFACE APPS
```

The script creates the role, and grants the necessary privileges on the required database objects. Check the file *paamgcrole.lst* to ensure that the script completed successfully.

Step 2: Create an Oracle Applications User

All API users must first be defined as Oracle Applications users. To define Oracle Applications users and their required responsibilities, use the Oracle Applications Users window. See: *Oracle Applications System Administrator's Guide*.

Step 3: Create a Database User

After you have defined an Oracle Applications user with the required responsibilities, you must create a database user. The Oracle Applications username and the database username must be identical. Oracle Projects provides the script *paamgcuser.sql* to create database users. The script resides in the $PA_TOP/sql directory on the server. The script creates an output file called *paamgcuser.lst.* Run the script from any directory in which you have write privileges. You run this script as any user, such as SYSTEM or SYS with a Create User and Create Synonym privileges on Oracle Projects Public APIs.

The script requires the following arguments:

- Existing database role name, such as PMXFACE. You must use the same role name that you created in Step 1.
- Username for the Oracle Applications user account, such as APPS
- Proposed new database username
- Proposed new database user password

From a SQL*Plus session, use the following syntax to run the script:

```
start $PA_TOP/sql/paamgcuser.sql &role &un_apps &uname &pwd
```

For example, to create the user JCLARK with a password of WELCOME, enter:

```
start $PA_TOP/sql/paamgcuser.sql PMXFACE APPS JCLARK WELCOME
```

Check the file *paamgcuser.lst*to ensure that the script completed successfully.

Template Script to Create Database Users

Oracle Projects provides a template script, *$PA_TOP/sql/paamgustemp.sql,* which facilitates the processing of large amounts of data. This script generates an output file, *pagenus.sql*, while creating a large number of database users from existing Oracle Applications users. You can add WHERE conditions to narrow the criteria. Run the script from any directory in which you have write privileges. You need to run this script only for users who require access to the Oracle Projects APIs. You run this script as any user, such as SYSTEM or SYS, with a Create User and Create Synonym privileges on Oracle Projects Public APIs.

Caution: The Oracle Applications user is different from the database

user, even if they share the same username. Each Oracle Applications user and database user has a distinct password, which you must maintain individually. Changing an Oracle Application user's password does not automatically change the database user's password. Users can choose different passwords for their Oracle Applications and database usernames.

Step 4: Set Up Your Product in Oracle Projects

Set up your external system as a source product in Oracle Projects using the Source Products window.

Restoring Grants to the Database

If the database has been exported and then imported and you performed Steps 1, 2, and 3 before the export/import, some or all of the grants may not work properly after the import. Use the script *paamgurole.sql* (located in $PA_TOP/sql) to restore the grants. You run this script as any user, such as SYSTEM or SYS, that has Grant privileges on Oracle Projects Public APIs and Views.

From a SQL*Plus session, use the following syntax to run the script:

```
start $PA_TOP/sql/paamgurole.sql &role &un_apps
```

For example:

```
start $PA_TOP/sql/paamgurole.sql PMXFACE APPS
```

Check the file *paamgurole.lst* to ensure that the script completed successfully.

Migrating Existing Roles from Previous Releases to Release 12

To migrate existing database roles and database users to use Oracle Projects Public APIs, run the scripts paamgurole.sql and paamguuser.sql in order. These scripts are located in the $PA_TOP/sql directory. You run these scripts as any user, such as SYSTEM or SYS, that has Grant privileges and Create Synonyms privileges on Oracle Projects Public APIs and Views.

From a SQL*Plus session, use the following syntax to run the *paamgurole.sql* script:

```
start $PA_TOP/sql/paamgurole.sql &role &un_apps
```

For example:

```
start $PA_TOP/sql/paamgurole.sql PMXFACE APPS
```

Check the file *paamgurole.lst* to ensure that the script completed successfully.

From a SQL*Plus session, use the following syntax to run the *paamguuser.sql* script:

```
start $PA_TOP/sql/paamguuser.sql &un_apps &name &role
```

For example:

```
start $PA_TOP/sql/paamguuser.sql APPS JCLARK PMXFACE
```

Check the file *paamguuser.lst* to ensure that the script completed successfully.

Security Requirements

Each interface or application that you develop using the Oracle Projects APIs must prompt users for identifying information and then set up global variables. Follow the steps below to ensure that proper security is enforced when users access Oracle Projects data from an external system.

Step 1: Authenticate the User

Your external system should prompt users for their Oracle Projects username and password and then use this login information to establish a connection to the Oracle Projects database. After three unsuccessful attempts to establish a connection, the external system should abort and display an error message.

Step 2: Choose a Responsibility

Because Oracle Applications responsibilities control users' access to Oracle Projects data, Oracle Applications users must choose a specific responsibility from the list of their valid responsibilities. Oracle Projects provides this information in the view PA_USER_RESP_V.

> **Note:** You can see an updated version of the view definitions in Oracle's electronic Technical Reference Manual web page.

Column descriptions for PA_USER_RESP_V are listed in Oracle eTRM, which is available on Oracle *Metalink.*

The login username entered in Step 1 controls the Oracle Applications responsibilities retrieved by this view. Once a user chooses a responsibility, the external system also stores the corresponding USER_ID and RESPONSIBILITY_ID. The RESPONSIBILITY_NAME field is for display purposes only and need not be stored.

> **Note:** Because Oracle Applications store user names in uppercase letters, you should convert login user names to uppercase letters before using them as keys. Database connection strings are case insensitive. For example, a login username entered as "scott" is stored as "SCOTT". Typical PL/SQL code to display the responsibilities reads as follows:

```
Login Name is stored in l_login_name
l_upper_login_name = UPPER(l_login_name)
Select RESPONSIBILITY_NAME, USER_ID,
RESPONSIBILITY_ID
from PA_USER_RESP_V where
USER_NAME = l_upper_login_name
```

Caution: Do not use UPPER(USER_NAME) in the WHERE clause. Expressions used in WHERE clauses disable the index and impair performance. Always convert a value to uppercase in your code and use the converted string in the WHERE clause.

Step 3: Set Up Global Variables

Access to Oracle Projects is controlled not only by a user's responsibility, but also by the user's organization for that responsibility. To ensure that the level of access to data matches a user's organization, use the API SET_GLOBAL_INFO to set up global variables. This API is located in the public API package PA_INTERFACE_UTILS_PUB.

SET_GLOBAL_INFO is a PL/SQL procedure that sets the global variables necessary to access data in a multi-org implemented environment.

The arguments P_RESPONSIBILITY_ID and P_USER_ID must have valid values. If the arguments contain null or invalid values, SET_GLOBAL_INFO returns an error status.

Parameters for SET_GLOBAL_INFO are shown in the following table:

Parameter	Usage	Type	Req?	Description
P_API_VERSION_NUMBER	IN	NUMBER	Yes	API standard
P_RESPONSIBILITY_ID	IN	NUMBER	Yes	The reference code that uniquely identifies the chosen responsibility (refer to Step 2: Choose a Responsibility, page 2-8)
P_USER_ID	IN	NUMBER	Yes	The identification code of the corresponding user returned by the view (refer to Step 2: Choose a Responsibility, page 2-8)
P_MSG_COUNT	OUT NOCOPY	NUMBER		API standard
P_MSG_DATA	OUT NOCOPY	VARCHAR2 (2000)		API standard
P_RETURN_STATUS	OUT NOCOPY	VARCHAR2 (1)		Return status. Valid values are: S (Success), E (Error), and U (Unexpected error).

Parameter	Usage	Type	Req?	Description
P_RESP_APPL_ID	IN	NUMBER	No	Identifier of the responsibility application
P_ADVANCED_PROJ_SEC _FLAG	IN	VARCHAR2	No	Flag that indicates whether to use role-based security (Default = N)
P_CALLING_MODE	IN	VARCHAR2	No	Calling mode
P_OPERATING_UNIT_ID	IN	NUMBER	No	Sets the ORG context

After completing these steps, external systems call the remaining Oracle Projects APIs necessary to complete the task, such as CREATE_PROJECT, UPDATE_PROJECT, SELECT_RESOURCE_LIST, or CREATE_DRAFT_BUDGET.

> **Note:** If you are not implementing Multiple Organization Access Control, you do not need to set the P_OPERATING_UNIT_ID parameter. In that case, the P_OPERATING_UNIT_ID parameter accepts the default MO: Operating Unit value assigned to the responsibility.

Handling Error Messages

The public APIs in Oracle Projects return applicable error messages for all updates, changes, or additions to a work breakdown structure or budget.

How Error Messages Are Created

The APIs do not stop processing when an error is encountered. Processing continues until all items are validated and error messages generated. However, if any errors are encountered during one of these processes, no records are saved to the Oracle Projects database.

The error messages contain all the information necessary to identify the data element related to each error. This information includes:

For WBS data:

- project reference
- task reference

For budget data:

- project reference
- task reference
- budget type
- budget start date

Displaying Error Messages

Because Oracle Projects APIs can be used to develop both real-time and batch integrations with external systems, display of error messages must be handled in the external application.

Use the API PA_INTERFACE_UTILS_PUB.get messages to retrieve the error messages. For details on this API and an example of PL/SQL code to retrieve the error messages, see: GET_MESSAGES, page 2-25.

API Messages

The following table shows the messages used in Oracle Projects APIs.

New Message Code	Length	Description	Token(s)
PA_API_CONV_ERROR _AMG	21	You entered an invalid API parameter. Please enter a valid parameter and try again.	ATTR_NAME, ATTR_VALUE
PA_ALL_WARN_NO _EMPL_REC_AMG	27	This user is not yet registered as an employee.	PROJECT_NUMBER, TASK_NUMBER, BUDGET_TYPE, RESOURCE_NAME, START_DATE
PA_BU_AMT_ALLOC_LT _ACCR_AMG	27	Total amount allocated cannot be less than amount accrued or billed.	PROJECT_NUMBER, TASK_NUMBER, BUDGET_TYPE, RESOURCE_NAME, START_DATE
PA_BU_BASE_RES_LIST _EXISTS_AMG	30	You cannot change the resource list for a baselined budget	PROJECT_NUMBER,T ASK_NUMBER, BUDGET_TYPE, RESOURCE_NAME, START_DATE

New Message Code	Length	Description	Token(s)
PA_BU_CORE_NO _VERSION_ID_AMG	28	A budget does not exist for this project with specified budget type.	PROJECT_NUMBER
PA_BU_INVALID_NEW _PERIOD_AMG	28	You cannot copy a budget to a period which is out of the range of system defined periods (for example, PA period or GL period).	PROJECT_NUMBER, TASK_NUMBER, BUDGET_TYPE, RESOURCE_NAME, START_DATE
PA_BU_NO_BUDGET_AMG	20	There are no budget lines in this draft budget. The budget must be entered before baseline.	PROJECT_NUMBER, TASK_NUMBER, BUDGET_TYPE, RESOURCE_NAME, START_DATE
PA_BU_NO_PROJ_END _DATE_AMG	26	Project does not have a start date or a completion date.	PROJECT_NUMBER, TASK_NUMBER, BUDGET_TYPE, RESOURCE_NAME, START_DATE
PA_BU_NO_TASK_PROJ _DATE_AMG	27	Task does not have a start date or a completion date.	PROJECT_NUMBER, TASK_NUMBER, BUDGET_TYPE, RESOURCE_NAME, START_DATE
PA_BU_UNBAL_PROJ _BUDG_AMG	25	Project funding is not equal to the budget total. To baseline a draft budget, the budget total must be as same as funding total.	PROJECT_NUMBER, TASK_NUMBER, BUDGET_TYPE, RESOURCE_NAME, START_DATE
PA_BU_UNBAL_TASK _BUDG_AMG	25	Task funding is not equal to the budget total of the task. To baseline a draft budget, the budget total must be as same as funding total.	PROJECT_NUMBER, TASK_NUMBER, BUDGET_TYPE, RESOURCE_NAME, START_DATE
PA_COPY_PROJECT _FAILED_AMG	26	Error occurred while creating the project.	PROJECT_NUMBER

New Message Code	Length	Description	Token(s)
PA_CREATE_CONTACTS _FAILED_AMG	29	Error occurred while creating Customer Contact information.	PROJECT_NUMBER
PA_CUST_NOT_ OVERRIDABLE_AMG	27	You cannot override the Customer field while using this template.	PROJECT_NUMBER
PA_DESC_NOT_ OVERRIDABLE_AMG	27	You cannot override the Description field while using this template.	PROJECT_NUMBER
PA_GET_CUST_INFO_ FAILED_AMG	27	Error occurred while getting Customer information.	PROJECT_NUMBER
PA_HAS_REV/INV_AMG	18	Distribution rule cannot be changed because cost/revenue/invoices exist. Cause: You cannot change the distribution rule because the project has costed items, revenue, or invoices.	PROJECT_NUMBER
PA_INVALID_DIST_RULE _AMG	24	Distribution Rule is invalid.	PROJECT_NUMBER
PA_INVALID_ORG_AMG	18	Organization is invalid.	PROJECT_NUMBER
PA_INVALID_PT_CLASS _ORG_AMG	27	Invalid organization. You cannot use the specified organization to create projects of this project type class. Choose a different organization or add the project type class to the current organization.	PROJECT_NUMBER
PA_NO_BILL_TO _ADDRESS_AMG	25	Active primary Bill To Address does not exist for the specified customer.	PROJECT_NUMBER
PA_NO_BILL_TO _CONTACT_AMG	25	Active primary billing contact does not exist for the specified customer.	PROJECT_NUMBER
PA_NO_CLIENT_EXISTS _AMG	23	The billing allocation across project client(s) is incomplete.	PROJECT_NUMBER

New Message Code	Length	Description	Token(s)
PA_NO_CONTACT _EXISTS_AMG	28	Billing contact not defined for each customer.	PROJECT_NUMBER
PA_NO_MANAGER _AMG	24	Project manager not currently defined for this project.	PROJECT_NUMBER
PA_NO_ORIG_PROJ_ID _AMG	22	Original project ID is not specified.	PROJECT_NUMBER
PA_NO_PROJ_CREATED _AMG	22	New project not created. No project information in the source project.	PROJECT_NUMBER
PA_NO_PROJ_ID_AMG	17	Project ID not specified.	PROJECT_NUMBER
PA_NO_REQ_CATEGORY _EXISTS_AMG	29	All mandatory class categories have not been classified.	PROJECT_NUMBER
PA_NO_SHIP_TO _ADDRESS_AMG	25	Active primary Ship To Address does not exist for the specified customer.	PROJECT_NUMBER
PA_NO_TASK_COPIED _AMG	21	No task is copied because there are tasks in the source project.	PROJECT_NUMBER
PA_NO_TASK_ID_D_AMG	19	You cannot delete this task because no task information has been provided.	PROJECT_NUMBER, TASK__NUMBER
PA_NO_TASK_ID_ST_AMG	20	You cannot create a subtask below this task because task information was not specified.	PROJECT_NUMBER, TASK__NUMBER
PA_NO_TOP_TASK_ID _ST_AMG	25	You cannot create a subtask below this task because task does not have top task ID.	PROJECT_NUMBER, TASK__NUMBER
PA_NO_UNIQUE_ID_AMG	19	Failed to generate unique project number. Action: Please contact your System Administrator to set up the Next Number field for Automatic Project Numbering in Implementation Options Window.	PROJECT_NUMBER

New Message Code	Length	Description	Token(s)
PA_PRODUCT_CODE _IS_MISSING_AMG	30	External product code required.	General
PA_PROJECT_NAME _IS_MISSING_AMG	30	Project name required.	PROJECT_NUMBER
PA_PROJECT_REF _IS_MISSING_AMG	29	External project reference required.	PROJECT_NUMBER
PA_PROJECT_STATUS _INVALID_AMG	29	The project status is invalid.	PROJECT_NUMBER
PA_PROJ_AP_INV _EXIST_D_AMG	26	You cannot delete this project because supplier invoices exist	PROJECT_NUMBER
PA_PROJ_BUDGET _EXIST_D_AMG	26	You cannot delete this project because budgets exist	PROJECT_NUMBER
PA_PROJ_BURDEN _SUM_DEST_D_AMG	29	The project is being used for the purpose of accumulating burden costs on project types.	PROJECT_NUMBER
PA_PROJ_CMT_TXN _EXIST_D_AMG	27	You cannot delete this project because project commitment transactions exist.	PROJECT_NUMBER
PA_PROJ_EVENT_EXIST _D_AMG	25	You cannot delete this project because events exist	PROJECT_NUMBER
PA_PROJ_EXP_ITEM _EXIST_D_AMG	28	You cannot delete this project because expenditure items exist.	PROJECT_NUMBER
PA_PROJ_FUND_EXIST _D_AMG	25	You cannot delete this project because funding exists.	PROJECT_NUMBER
PA_PROJ_INV_DIST _EXIST_D_AMG	28	You cannot delete this project because supplier invoice distribution lines exist	PROJECT_NUMBER

New Message Code	Length	Description	Token(s)
PA_PROJ_IN_USE _EXTERNAL_D_AMG	29	You cannot delete this project because project references exist	PROJECT_NUMBER
PA_PROJ_ORG_NOT _ACTIVE_AMG	26	This project organization is not active or is not within the current Project/Task owning organization hierarchy.	PROJECT_NUMBER
PA_PROJ_PO_DIST _EXIST_D_AMG	27	You cannot delete this project because purchase order distributions exist	PROJECT_NUMBER
PA_PR_COM_RUL_SET _EXIST_D_AMG	29	You cannot delete this project because compensation rules exist	PROJECT_NUMBER
PA_PR_CREATED_REF _EXIST_D_AMG	29	You cannot delete this project because compensation rule sets exist	PROJECT_NUMBER
PA_PR_INSUF_BILL _CONTACT_AMG	28	Billing contact not defined for each customer.	PROJECT_NUMBER
PA_PR_INSUF_CLASS _CODES_AMG	27	You must specify all mandatory class categories.	PROJECT_NUMBER
PA_PR_INSUF_PROJ _MGR_AMG	24	Project manager not currently defined for this project.	PROJECT_NUMBER
PA_PR_INVALID_START _DATE_AMG	28	Project start date must be earlier than all task start dates.	PROJECT_NUMBER
PA_PR_NAME_NOT _UNIQUE_AMG	27	Project name must be unique across all operating units in the Oracle Applications installation.	PROJECT_NUMBER
PA_PR_NAME_NOT _UNIQUE_A_AMG	25	Project name must be unique across all operating units in the Oracle Applications installation.	PROJECT_NUMBER

New Message Code	Length	Description	Token(s)
PA_PR_NO_PROJ_NAME _AMG	22	Project name not specified.	PROJECT_NUMBER
PA_PR_NO_PROJ_NUM _AMG	21	Project number ID not specified.	PROJECT_NUMBER
PA_PR_NO_UPD _SEGMENT1_EXP_AMG	29	You cannot change the project number because expenditure items exist	PROJECT_NUMBER
PA_PR_NUMERIC_NUM _REG_AMG	25	Please enter a numeric project number.	PROJECT_NUMBER
PA_PR_NUMERIC_NUM _REQ_AMG	25	Your implementation requires a numeric project number.	PROJECT_NUMBER
PA_PR_NUM_NOT _UNIQUE_AMG	26	Project number must be unique across all operating units in the Oracle Applications installation.	PROJECT_NUMBER
PA_PR_NUM_NOT _UNIQUE_A_AMG	24	Project number must be unique across all operating units in the Oracle Applications installation.	PROJECT_NUMBER
PA_PR_PO_REQ_DIST _EXIST_D_AMG	29	You cannot delete this project because purchase order requisitions exist.	PROJECT_NUMBER
PA_PR_START_DATE _NEEDED_AMG	27	The start date of the project is required if the completion date of the project is specified.	PROJECT_NUMBER
PA_PR_START_DATE _NEEDED_AMG	23	The start date of the project is required if the completion date of the project is specified.	PROJECT_NUMBER
PA_PUBLIC_SECTOR _INVALID_AMG	28	Invalid value for Public Sector flag.	PROJECT_NUMBER

New Message Code	Length	Description	Token(s)
PA_RE_ASSGMT_NOT_FOUND_AMG	26	Resource list assignment not found.	PROJECT_NUMBER
PA_RE_PROJ_NOT_FOUND_AMG	24	Specified project is invalid.	PROJECT_NUMBER
PA_RE_RL_INACTIVE_AMG	21	Resource list is not active.	PROJECT_NUMBER
PA_RE_RL_NOT_FOUND_AMG	22	Specified resource list is invalid.	PROJECT_NUMBER
PA_RE_USE_CODE_NOT_FOUND_AMG	28	Use code not found.	PROJECT_NUMBER
PA_SOURCE_TEMPLATE_INVALID_AMG	30	Source template ID is invalid.	PROJECT_NUMBER
PA_SOURCE_TEMP_IS_MISSING_AMG	30	Source template ID is required.	PROJECT_NUMBER
PA_SU_INVALID_DATES_AMG	23	From Date must be on or before the To Date.	PROJECT_NUMBER
PA_TASK_BURDEN_SUM_DEST_ST_AMG	30	The task is being used for the purpose of accumulating burden costs on project types.	PROJECT_NUMBER, TASK__NUMBER
PA_TASK_BURDEN_SUM_DEST_ST_AMG	29	The task is being used for the purpose of accumulating burden costs on project types.	PROJECT_NUMBER, TASK__NUMBER
PA_TASK_FUND_NO_PROJ_EVT_AMG	28	Task funding with project level events is not allowed.	PROJECT_NUMBER, TASK_NUMBER, BUDGET_TYPE, RESOURCE_NAME, START_DATE

New Message Code	Length	Description	Token(s)
PA_TASK_IN_USE _EXTERNAL_D_AMG	26	You cannot delete this task because task references exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_AP_INV_DIST _EXIST_D_AMG	30	You cannot delete this task because invoice distribution lines exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_AP_INV_DIST _EXIST_ST_AMG	30	You cannot create a subtask below this task because supplier invoice distribution lines exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_AP_INV_EXIST _D_AMG	25	You cannot delete this task because supplier invoices exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_AP_INV_EXIST _ST_AMG	26	You cannot create a subtask below this task because supplier invoices exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_ASSETASSIG _EXIST_ST_AMG	30	You cannot create a subtask below this task because assets have been assigned.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_BUDGET _EXIST_D_AMG	25	You cannot delete this task because budgets exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_BUDGET _EXIST_ST_AMG	26	You cannot create a subtask below this task because budgets exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_BUR_SCHOVR _EXIST_ST_AMG	30	You cannot create a subtask below this task because burden schedule overrides exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_CMT_TXN _EXIST_D_AMG	26	You cannot delete this task because commitment transactions exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_EBILL_RATE _EXIST_ST_AMG	30	You cannot create a subtask below this task because employee billing rate overrides exist.	PROJECT_NUMBER, TASK__NUMBER

New Message Code	Length	Description	Token(s)
PA_TSK_EVENT_EXIST_D_AMG	24	You cannot delete this task because events exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_EXP_ITEM_EXIST_D_AMG	27	You cannot delete this task because expenditure items exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_EXP_ITEM_EXIST_ST_AMG	28	You cannot create a subtask below this task because expenditure items exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_FUND_EXIST_D_AMG	27	You cannot delete this task because supplier invoice distribution line exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_JBILLTITLE_EXIST_ST_AMG	30	You cannot create a subtask below this task because job billing title overrides exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_JBILL_RATE_EXIST_ST_AMG	30	You cannot create a subtask below this task because job bill rate overrides exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_LAB_MULT_EXIST_ST_AMG	26	You cannot create a subtask below this task because there is labor multiplier for this task.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_L_COST_MUL_EXIST_ST_AMG	30	You cannot create a subtask below this task because labor cost multipliers exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_NL_BIL_RAT_EXIST_ST_AMG	30	You cannot create a subtask below this task because non-labor bill rate overrides exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_PO_DIST_EXIST_D_AMG	26	You cannot delete this task because supplier invoice distribution lines exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_PO_DIST_EXIST_ST_AMG	27	You cannot create a subtask below this task because supplier invoice distribution lines exist.	PROJECT_NUMBER, TASK__NUMBER

New Message Code	Length	Description	Token(s)
PA_TSK_PO_REQDIST _EXIST_ST_AMG	30	You cannot create a subtask below this task because purchase order requisitions exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_RULE_SET _EXIST_D_AMG	27	You cannot delete this task because compensation rule sets exist.	PROJECT_NUMBER, TASK__NUMBER
PA_TSK_TXN_CONT _EXIST_ST_AMG	28	You cannot create a subtask below this task because transaction controls exist.	PROJECT_NUMBER, TASK__NUMBER

Standard API Parameters

All Oracle Projects APIs have a set of standard input and output parameters that are used in most of the public procedures. The table below describes each of these standard API parameters.

Parameter	Usage	Type	Req?	Description
P_COMMIT	IN	VARCHAR2 (1)	Yes	T = The API issues the commit to the database. Default = F (False)
P_INIT_MSG_LIST	IN	VARCHAR2 (1)	Yes	Set this parameter to T (True) if you want to initialize the global message table. Default = F (False)
P_API_VERSION _NUMBER	IN	NUMBER	Yes	For the current version of the APIs, this parameter must be set to 1.0. This may change in future versions of the APIs.
P_RETURN _STATUS	OUT NOCOPY	VARCHAR2 (1)		The return status of the APIs. Valid values are: S (the API completed successfully), E (business rule violation error), and U (Unexpected error, such as an Oracle error)

Parameter	Usage	Type	Req?	Description
P_MSG_COUNT	OUT NOCOPY	NUMBER		Holds the number of messages in the global message table. Calling programs should use this as the basis to fetch all the stored messages. If the value for this parameter = 1, then the message code is available in P_MSG_DATA. If the value of this parameter > 1, you must use the GET_MESSAGES API to retrieve the messages.
P_MSG_DATA	OUT NOCOPY	VARCHAR2 (2000)		Holds the message code, if the API returned only one error/warning message. Otherwise, the column is left blank.

APIs That Use Composite Datatypes

Read this section if you use PL/SQL 2.3 or higher to call Oracle Projects APIs that use composite datatypes, such as an array of records

If you assign a value to a subset of variables in a PL/SQL array, first assign the values to a PL/SQL record and then add the record to the PL/SQL array. It is important to perform the steps in this order due to the way PL/SQL handles assignments to an array.

The following sample PL/SQL code shows how to assign values to the P_BUDGET_LINES_IN PL/SQL table in the CREATE_DRAFT_BUDGET API.

```
DECLARE
--variables needed for API standard parameters
l_api_version_number  NUMBER :=1.0;
l_commit      VARCHAR2(1)  := 'F';
l_return_status   VARCHAR2(1);
l_init_msg_list   VARCHAR2(1);
l_msg_count    NUMBER;
l_msg_data     VARCHAR2(2000);
l_data      VARCHAR2(2000);
l_msg_entity    VARCHAR2(100);
l_msg_entity_index  NUMBER;
l_msg_index    NUMBER;
l_msg_index_out   NUMBER;
l_encoded     VARCHAR2(1);
--
--variables needed for Oracle Project specific parameters
l_pm_product_code VARCHAR2(10);
l_pa_project_id NUMBER;
l_pm_project_reference VARCHAR2(25);
l_budget_type_code VARCHAR2(30);
l_change_reason_code VARCHAR2(30);
l_description VARCHAR2(255);
l_entry_method_code VARCHAR2(30);
l_resource_list_name VARCHAR2(60);
l_resource_list_id NUMBER;
l_budget_lines_in
PA_BUDGET_PUB.budget_line_in_tbl_type;
l_budget_lines_in_rec
PA_BUDGET_PUB.budget_line_in_rec_type;
l_budget_lines_out
PA_BUDGET_PUB.budget_line_out_tbl_type;
l_line_index NUMBER;
l_line_return_status VARCHAR2(1);
--
API_ERROR EXCEPTION;
--
BEGIN
--PRODUCT RELATED DATA
l_pm_product_code :='SOMETHING';
--
--BUDGET DATA
l_pm_project_reference := 'TEST';
l_budget_type_code := 'AC';
l_change_reason_code := 'ESTIMATING ERROR';
l_description := 'New description -> 2';
l_entry_method_code := 'PA_LOWEST_TASK_BY_PA_PERIOD';
l_resource_list_id := 1001;
```

The previous example shows how to assign values to a subset of the PL/SQL table. To assign values only to PA_TASK_ID and RESOURCE_LIST_MEMBER_ID in the P_BUDGET_LINES_IN table, first assign these values to BUDGET_LINES_IN_REC and then add BUDGET_LINES_IN_REC to the BUDGET_LINES_IN PL/SQL table, as illustrated in the following example.

```
--BUDGET LINES DATA
a := 5;
FOR i IN 1..a LOOP
if i = 1 THEN
l_budget_lines_in_rec.pa_task_id :=1496;
l_budget_lines_in_rec.resource_list_member_id:=1731;
elsif i = 2 THEN
l_budget_lines_in_rec.resource_list_member_id:=1732;
l_budget_lines_in_rec.pa_task_id := 1495;
elsif i = 3 THEN
l_budget_lines_in_rec.resource_list_member_id:=1733;
l_budget_lines_in_rec.pa_task_id := 1494;
elsif i = 4 THEN
l_budget_lines_in_rec.resource_list_member_id:=1734;
l_budget_lines_in_rec.pa_task_id := 1492;
elsif i = 5 THEN
l_budget_lines_in_rec.resource_list_member_id:=1735;
l_budget_lines_in_rec.pa_task_id := 1491;
end if;
l_budget_lines_in_rec.quantity:=97;
l_budget_lines_in_rec.period_name:= 'P06-03-95';
l_budget_lines_in_rec.raw_cost:=300;
l_budget_lines_in(i) := l_budget_lines_in_rec;
END LOOP;
pa_budget_pub.create_draft_budget
( p_api_version_number => l_api_version_number
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_return_status => l_return_status
,p_pm_product_code => l_pm_product_code
,p_pa_project_id=> l_pa_project_id
,p_pm_project_reference => l_pm_project_reference
,p_budget_type_code=> l_budget_type_code
,p_change_reason_code => l_change_reason_code
,p_description => l_description
,p_entry_method_code => l_entry_method_code
,p_resource_list_name => l_resource_list_name
,p_resource_list_id=> l_resource_list_id
,p_budget_lines_in => l_budget_lines_in
,p_budget_lines_out => l_budget_lines_out );
```

Named Notation for Parameters

The APIs for Oracle Projects typically allow you to reference Oracle Projects entities by either identification codes or reference codes. For example, you can refer to a project using either the PROJECT_ID or the PM_PROJECT_REFERENCE.

Identification codes are usually system-generated numbers assigned to the entity by Oracle Projects. The reference code is usually a character name or description for the entity.

If a project already exists in Oracle Projects, you can reduce your processing time by passing identification codes instead of reference codes to the APIs. The APIs read identification codes and convert passed reference codes to their corresponding identification codes before execution.

If an API requires a given entity for processing, you must pass either the entity's reference code parameter or the entity's identification code parameter, but not both. If

the API cannot find or derive a reference code for the required identification code parameter, the API generates an error message and aborts processing.

When passing parameters to an Oracle Projects API, you should use *named notation* (see the following example), which enables you to pass only the parameters required by a particular API. Using named notation can significantly improve the processing of update APIs.

> **Important:** If you pass an API parameter as NULL, the API updates the column in the database with a NULL value. If you do not want to update a column, do not pass the corresponding parameter.

Example of Named Notation

Using the API DELETE_PROJECT, you can pass either the PROJECT_ID or the PM_PROJECT_REFERENCE for the project. The following example passes the project identification code P_PA_PROJECT_ID. The SQL statement below omits optional parameters, such as P_INIT_MSG_LIST and P_COMMIT, so that they will not be updated in the table.

```
Delete_Project(p_api_version_number => 1.0
, p_msg_count => l_msg_count
, p_msg_data => l_msg_data
, p_return_status => l_return_status
, p_pm_product_code => l_product_code
, p_pa_project_id => 1043
);
```

Data Supplied by Oracle Projects Views

The Oracle Projects APIs use identification code and reference code parameters for many Oracle Projects entities. To facilitate the retrieval of valid parameter data, selected views supply Oracle Projects data. These views are listed in the detail chapters for each Oracle Projects application.

Common APIs

The following APIs are available for use in all modules and are located in the public API package PA_INTERFACE_UTILS_PUB.

GET_MESSAGES

GET_MESSAGES is a PL/SQL procedure that retrieves messages from the message stack. If an API detects only one error during execution, the API returns the error text via the standard API output parameter P_MSG_DATA. If the API detects multiple errors, you must use the GET_MESSAGES API to retrieve the messages.

The following table shows the parameters in GET_MESSAGES.

Parameter	Usage	Type	Req?	Description
P_ENCODED	IN	VARCHAR2 (1)	No	T: Return message code; F (Default): Return message text
P_MSG_COUNT	IN	NUMBER	No	The message count value returned by the API that raised the error. If P_MSG_COUNT = 1, this API returns the error text. Otherwise, this API calls the message handling package FND_MSG_PUB.
P_MSG_DATA	IN	VARCHAR2 (80)	Yes	The P_MSG_DATA value returned by the API that raised the error
P_DATA	OUT NOCOPY	VARCHAR2 (2000)		The message code (if P_ENCODED = T) or the message text (if P_ENCODED = F)
P_MSG_INDEX_OUT	OUT NOCOPY	NUMBER		The index (cell) of the message in the global message stack
P_MSG_INDEX	IN	NUMBER	No	Message index number (default = 1)

Sample Code for Handling Multiple Messages

The following sample PL/SQL code shows how you can use GET_MESSAGES to handle multiple messages in an external application.

This example uses the procedure PA_PROJECT_PUB.create_project. You can initialize the message stack at the beginning of the session, as in this example, or for each project.

All messages are held in PL/SQL memory. For a large installation where there may be a lot of error messages, you can store all messages related to a project in a file or in the database, and initialize the message stack frequently. You use FND_MSG_PUB.initilize to initialize the message stack.

You can temporarily insert the messages into a table, as shown in the example. Or, if you are running a 'C' program or using PL/SQL file I/O utilities, you can write the messages to a log file. If you write the messages to a log file, you may want to create header information in the log file. You can then launch a text editor to instantly display the error messages.

Note: The parameter *p_msg_index_out* in this code sample was added as

a workaround to a known bug in Oracle AOL. This parameter may be removed in subsequent releases of Oracle Projects. If your code stops working after applying patches later than 754949, values sent as this parameter would be a likely cause.

Following is the sample code:

```
-- Initialize the message stack
FND_MSG_PUB.initialize;
pa_project_pub.create_project
(p_api_version_number => l_api_version_number
,p_commit => l_commit
,p_init_msg_list => 'F'
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_return_status => l_return_status
,p_pm_product_code => l_pm_product_code
,p_project_in => l_project_in_rec
,p_project_out => l_project_out_rec
,p_key_members => l_key_member_tbl
,p_class_categories => l_class_category_tbl
,p_tasks_in => l_tasks_in
,p_tasks_out => l_tasks_out);
IF l_return_status != 'S'
THEN
if l_msg_count > 0 THEN
for i in 1..l_msg_count loop
pa_interface_utils_pub.get_messages (
,p_encoded => 'F'
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_data => l_data
,p_msg_index_out => l_msg_index_out );
-- Insert the messages from l_data into error_table
Insert into error_table (error_msg) values (l_data);
end loop;
end if;
END IF;
```

GET_DEFAULTS

GET_DEFAULTS is a PL/SQL procedure that returns the default values required to initialize the VARCHAR2, NUMBER, and DATE variables in your programs. This API has no input parameters.

The following table shows the parameters in GET_DEFAULTS.

Parameter	Usage	Type	Description
P_DEF_CHAR	OUT NOCOPY	VARCHAR2(3)	Returns the default value for character variables

Parameter	Usage	Type	Description
P_DEF_NUM	OUT NOCOPY	NUMBER	Returns the default value for number variables
P_DEF_DATE	OUT NOCOPY	DATE	Returns the default value for date variables
P_RETURN_STATUS	OUT NOCOPY	VARCHAR2(1)	API standard
P_MSG_COUNT	OUT NOCOPY	NUMBER	API standard
P_MSG_DATA	OUT NOCOPY	VARCHAR2(2000)	API standard

Default values are useful when you conditionally set a value for a variable. For example, while updating a project, you may conditionally set the value for the variable L_DISTRIBUTION_RULE, depending on whether you want to update the distribution rule in Oracle Projects. To accomplish this, you would use a PL/SQL statement similar to this:

```
Pa_interface_utils.get_defaults (p_def_char => l_def_char,
p_def_num => l_def_num,
p_def_date => l_def_date,
p_return_status => l_return_status,
p_msg_count => l_msg_count,
p_msg_data => l_msg_data );
l_distribution_rule := l_def_char;
l_customer_id := l_def_num;
l_end_date := l_def_date;
```

GET_ACCUM_PERIOD_INFO

GET_ACCUM_PERIOD_INFO is a PL/SQL procedure that returns information about the last period through which the project is summarized in Oracle Projects, as well as the current reporting period. Use this API to see if the actuals in your external system are current with those in Oracle Projects.

The following table shows the parameters in GET_ACCUM_PERIOD_INFO.

Parameter	Usage	Type	Required	Description
p_API_VERSION_NUMBER	IN	NUMBER	Y	API standard
p_MSG_COUNT	OUT NOCOPY	NUMBER		API standard

Parameter	Usage	Type	Required	Description
p_MSG_DATA	OUT NOCOPY	VARCHAR2 (2000)		API standard
p_RETURN_STATUS	OUT NOCOPY	VARCHAR2 (1)		API standard
p_PROJECT_ID	IN	NUMBER	Y	Unique identifier of the project
p_LAST_ACCUM_PERIOD	OUT NOCOPY	VARCHAR2		The period up to which the project has been summarized
p_LAST_ACCUM_START_DATE	OUT NOCOPY	DATE		The start date of the last summarized period
p_LAST_ACCUM_END_DATE	OUT NOCOPY	DATE		The end date of the last summarized period
p_CURRENT_REPORTING _PERIOD	OUT NOCOPY	VARCHAR2		The PA period that is defined in the current reporting period
p_CURRENT_PERIOD_START _DATE	OUT NOCOPY	DATE		The start date of the current reporting period
p_CURRENT_PERIOD_END _DATE	OUT NOCOPY	DATE		The end date of the current reporting period

This PL/SQL example demonstrates a typical use of GET_ACCUM_PERIOD_INFO:

```
Pa_interface_utils.get_accum_period_info
(p_api_version_number => l_api_version_number
l_msg_count => l_msg_count,
p_msg_data => l_msg_data,
p_return_status => l_return_status,
p_project_id => l_project_id,
p_last_accum_period => l_last_accum_period,
p_last_accum_start_date => l_last_accum_start_date,
p_last_accum_end_date => l_last_accum_end_date,
p_current_reporting_period => l_current_reporting_period,
p_period_start_date => l_period_start_date,
p_period_end_date => l_period_end_date);
```

Controlling Actions in Oracle Projects

To ensure that information in your external systems remains consistent with information in Oracle Projects, you can restrict the changes users can make to data that originates in external systems. Use the Oracle Projects Control Actions window to select the actions that you want to restrict. You can restrict these actions:

- Add Task
- Baseline Budget
- Delete Project
- Delete Task
- Update Budget
- Update Project Dates
- Update Project Description
- Update Project Name
- Update Project Number
- Update Project Organization
- Update Project Status
- Update Task Dates
- Update Task Description
- Update Task Name
- Update Task Number
- Update Task Organization

You can base the restrictions on the external system in which the information originates or on the budget type (for budget-related actions).

For example, suppose you download a project from an external system. You have a business rule that the source system always maintains project and task dates. As an additional precaution, you want to prevent users from deleting from Oracle Projects any projects and tasks that originate in an external system. To fulfill these criteria, use the Control Actions window to specify the following actions:

- Delete Project
- Delete Task
- Update Project Dates
- Update Task Dates

After you specify these actions in the Control Actions window, Oracle Projects users who try to change the project and task dates on a project that originated in an external system sees the following error message:

```
The value for this field originated in an external system. You cannot
change it.
```

A user who tries to delete the project or one of its tasks sees the following message:

```
The record originated in an external system. You cannot delete it.
```

> **Note:** You can specify effective dates for the controls you select in the Control Actions window.

Using API Procedures

The detailed chapters contain descriptions of each PL/SQL procedure used to perform certain functions in Oracle Projects based on the information you maintain in your external system.

Some APIs use composite datatypes, such as records or tables of records, as input and output parameters. Composite datatypes are PL/SQL 2.3 features that are available with Oracle 7.3.2. For more information about composite datatypes, see APIs That Use Composite Datatypes, page 2-22.

Tools and products that cannot use composite datatypes must call supplementary Load-Execute-Fetch APIs instead. The Load-Execute-Fetch APIs were designed without composite datatype parameters for compatibility with any tool and perform the following functions:

- Accept parameters with standard datatypes (VARCHAR2, NUMBER, and DATE) as IN parameters
- Load global composite type structures (records and tables)
- Call the underlying business object APIs (passing the global structures as IN parameters)
- Read the results from a global message and results table
- Pass the message back to the calling programs upon demand (the calling program

fetches each message separately)

Call the procedures in this order:

1. **Initialize**. This step initializes the global data structures.

2. **Load.** This function loads IN parameter PL/SQL tables and records. Repeat this step until all the input structures are populated.

3. **Execute.** This step calls a business object API cover that calls the business object API. The business object API uses the global structures that were populated during the Load procedure.

4. **Fetch.** This procedure fetches one output value at a time for a business object. It also fetches messages. The calling program may or may not call the Fetch procedure, depending on the function performed.

5. **Clear.** This step clears the global structures and resets any global counters used in the calling program.

3

Oracle Project Foundation APIs

This chapter describes how to implement APIs for:

- Project and task information
- Structure information
- Resource list and resource list member information
- Dependency information
- Task Assignment information

This chapter covers the following topics:

- Project Definition APIs
- Project Definition API Procedure Definitions
- Project Definition Record and Table Datatypes
- Using Project Definition APIs
- Creating a Project Using the Load-Execute-Fetch APIs
- Structure APIs
- Structure APIs Procedure Definitions
- User-Defined Attribute APIs
- Resource APIs
- Resource API Procedure Definitions
- Planning Resource List APIs
- Planning Resource List API Definitions
- Resource Breakdown Structure APIs
- Resource Breakdown Structure API Procedure Definitions

- Dependency APIs
- Dependency API Procedure Definitions
- Task Assignment APIs
- Task Assignment API Procedure Definitions

Project Definition APIs

This chapter includes detailed descriptions of the APIs that you can use to integrate project data from an external system with Oracle Projects. This chapter also includes detailed descriptions of the PL/SQL procedures used to verify in real-time that:

- Project you have entered into your external system is unique in Oracle Projects
- Certain functions, such as deleting a project , follow the business rules defined in Oracle Projects

Develop a detailed project plan using the external system you prefer. Then you can use the project APIs to push your plan into Oracle Projects and create a project based on the information in your plan. As your project plan evolves, update project information in your external system and then periodically synchronize the two systems. The project APIs update the task information and work breakdown structures (WBSs) in Oracle Projects to reflect changes made in the external system.

> **Note:** When youcall any project API that requires a project identifier, you must identify the project by passing either the P_PA_PROJECT_ID or the P_PM_PROJECT_REFERENCE parameter.

Project Definition API Views

The following list shows the views that provide parameter data for the project definition APIs. For detailed description of the views, refer to Oracle eTRM, which is available on Oracle *MetaLink*.

View	Description
PA_CUSTOMERS_LOV_V	Retrieves customers defined in or used by Oracle Projects

View	Description
PA_CLASS_CATEGORIES_LOV_V	Retrieves class codes defined in Oracle Projects. You can use the value in the display_name field (retrieved by the PA_OVERRIDE_FIELDS_V view) to show only class codes associated with a class category. For example: "select code description from pa_class_categories_lov_v where class_category = 'Funding Source';"
PA_DISCOUNT_CODES_LOV_V	Retrieves the discount reasons specified for the lookup type RATE AND DISCOUNT REASON.Used to validate the parameters LABOR_DISC_REASON_CODE and NON_LABOR_DISC_REASON_CODE.
PA_DISTRIBUTION_RULES_LOV_V	Retrieves revenue distribution rules defined in Oracle Projects.
PA_EMPLOYEE_SCHEDULES_LOV_V	Retrieves employee schedules. Only the following employee schedules are retrieved: - If the MULTI_CURRENCY_BILLING_FLAG of the project is not Y, only schedules whose RATE_SCH_CURRENCY_CODE matches the project functional currency are retrieved. - Only schedules whose SHARE_ACROSS_OU_FLAG is set to Y or whose operating unit matches the operating unit for the project are retrieved.
PA_JOB_SCHEDULES_LOV_V	Retrieves job schedules. Only the following job schedules are retrieved: - If the MULTI_CURRENCY_BILLING_FLAG of the project is not Y, only schedules whose RATE_SCH_CURRENCY_CODE matches the project functional currency are retrieved. - Only schedules whose SHARE_ACROSS_OU_FLAG is set to Y or whose operating unit matches the operating unit for the project are retrieved. - Only schedules whose JOB_GROUP_ID matches the job group defined for the project type of the project are retrieved.
PA_INVOICE_SCHEDULES_LOV_V	Retrieves active invoice burden schedules
PA_KEY_MEMBERS_LOV_V	Retrieves names and employee identification numbers of team members from Oracle Projects. Note: pa_employees returns all employees defined in Oracle Projects.

View	Description
PA_ORG_NL_SCHDL_LOV_V	Retrieves non-labor schedules. Only the following non-labor schedules are retrieved: - If the MULTI_CURRENCY_BILLING_FLAG of the project is not Y, only schedules whose RATE_SCH_CURRENCY_CODE matches the project functional currency are retrieved. - Only schedules whose SHARE_ACROSS_OU_FLAG is set to Y or whose operating unit matches the operating unit for the project are retrieved.
PA_ORGANIZATIONS_LOV_V	Retrieves names of organizations defined in Oracle Projects
PA_OVERRIDE_FIELDS_V	Retrieves the prompts for Quick Entry fields associated with a project template. For more information about this view, see; Details about PA_OVERRIDE_FIELDS_V, page 3-4.
PA_OVERRIDE_FIELD_VALUES_V	Retrieves the values passed to the Quick Entry fields when a project is created
PA_PROJECT_STATUS_LOV_V	Retrieves project statuses from Oracle Projects
PA_PROJECTS_AMG_V	Retrieves project information for the organization associated with the user's responsibility. This view provides a list of projects and its related attributes.
PA_REVENUE_SCHEDULES_LOV_V	Retrieves active revenue burden schedules.
PA_SELECT_TEMPLATE_V	Retrieves project templates and projects defined in Oracle Projects

Details About PA_OVERRIDE_FIELDS_V

The following table shows the contents of some of the columns of the view PA_OVERRIDE_FIELDS_V, for a project with a project identification code of 1020 and all quick entry fields enabled. The value of the ID field for all of the columns is 1020.

Field Name	Display Name	Type	Order	Req?	View Name
NAME	Project Name		20	Y	

Field Name	Display Name	Type	Order	Req?	View Name
DESCRIPTION	Project Description		30	N	
START_DATE	Project Start Date		40	N	
COMPLETION_DATE	Project Completion Date		50	N	
PROJECT_STATUS _CODE	Project Status		60	N	PA_PROJECT _STATUS_LOV_V
PUBLIC_SECTOR _FLAG	Public Sector		70	N	
DISTRIBUTION_RULE	Distribution Rule		80	N	PA_DISTRIBUTION_RULES _LOV_V
CARRYING_OUT _ ORGANIZATION_ID	Organization		90	N	PA_ORGANIZATIONS_LOV _V
KEY_MEMBER	Project Manager	PROJECT MANAGER	100	Y	PA_KEY_MEMBERS _LOV_V
KEY_MEMBER	Project Coordinator	Project Coordinator	110	N	PA_KEY_MEMBERS _LOV_V
CLASSIFICATION	Funding Source	Funding Source	120	Y	PA_CLASS_CATEGORIES _LOV_V
CLASSIFICATION	Market Sector	Market Sector	130	N	PA_CLASS_CATEGORIES _LOV_V
CUSTOMER_NAME	Customer Name	PRIMARY	140	N	PA_CUSTOMERS_LOV_V

The views you use to select valid values all have CODE and DESCRIPTION columns. Use these two columns and the value of the field LOV_VIEW_NAME to retrieve the valid values for any Quick Entry field. Valid values are stored in the CODE field. The

table below shows the valid values of the quick entry fields.

Quick Entry Fields	Valid Values
NAME	(not validated)
CARRYING_OUT_ ORGANIZATION_ID	PA_ORGANIZATIONS_LOV_V
PUBLIC_SECTOR_FLAG	Y or N
PROJECT_STATUS_CODE	PA_PROJECT_STATUS_LOV_V
DESCRIPTION	(not validated)
START_DATE	DD-MON-YY format (e.g., 10-SEP-68)
COMPLETION_DATE	DD-MON-YY format (e.g., 13-JUL-94)
DISTRIBUTION_RULE	PA_DISTRIBUTION_RULES_LOV_V
CUSTOMER_ID	PA_CUSTOMERS_LOV_V (currently, the default CUSTOMER_ RELATIONSHIP_CODE is PRIMARY. No other value is accepted)
KEY_MEMBERS (multiple)	PA_KEY_MEMBERS_LOV_V
CLASS_CATEGORIES (multiple)	PA_CLASS_CATEGORIES_LOV_V

Project Definition API Procedures

The procedures discussed in this section are listed below. The procedures are located in the public API package PA_PROJECT_PUB.

- Project Procedures
  - CREATE_PROJECT, page 3-8
  - DELETE_PROJECT, page 3-9
  - UPDATE_PROJECT, page 3-10
- Load-Execute-Fetch Procedures

Project Definition API Procedure Definitions

This section contains description of the Project Definition APIs, including business rules and parameters.

Common Project Definition API Parameters

The following descriptions apply to columns that are used throughout the Project Definition APIs.

PM_PROJECT_REFERENCE

Systems that you use to create projects in Oracle Projects assign a unique number to every project. You can set up Oracle Projects either to generate project numbers automatically or to support manual entry of numbers.

When Oracle Projects is set up for automatic numbering:

- The number generated automatically by Oracle Projects is stored in the column SEGMENT1.
- The number assigned by the external system is stored in the column PM_PROJECT_REFERENCE.

When Oracle Projects is set up for manual numbering, the number assigned by the external system is stored in both SEGMENT1 and PM_PROJECT_REFERENCE.

> **Note:** Oracle Projects windows display only SEGMENT1 as the project number, so you should set up Oracle Projects to support manual numbering if you plan to integrate Oracle Projects with an external system.

Project and Task Start and Finish Dates

Most external systems hold additional start and finish dates for projects and tasks. For information about using a client extension to pass these additional dates (instead of the default Oracle Projects project dates), see Project and Task Date Client Extension, page 8-5.

CREATE_PROJECT

CREATE_PROJECT is a PL/SQL procedure that creates a project in Oracle Projects using a template or an existing project.

> **Note:** CREATE_PROJECT will not copy the WBS structure to the newly created project if you are attempting to copy a project or template with tasks. CREATE_PROJECT also will not copy the WBS structure to the newly created project if you are attempting to copy a template which has the Automatically Publish Workplan Upon Project Creation option selected.

This API uses composite datatypes. For more information, see APIs That Use Composite Datatypes, page 2-22.

> **Note:** When loading descriptive flexfields using Oracle Projects APIs, if the DFF is not context sensitive, then the parameter ATTRIBUTE_CATEGORY is required to have a value such as 'Global Data Elements'. Otherwise, the APIs do not import rows.

Business Rules

Oracle Projects imposes the following business rules.

Performing Scheduling Validations

When set to 'N' the P_OP_VALIDATE_FLAG parameter eliminates redundant validation for certain types of scheduling data. Unnecessary scheduling validations can slow system performance.

You should set P_OP_VALIDATE_FLAG to 'N' if you are using this API to integrate a

third-party scheduling tool with Oracle Projects. Only set this parameter to 'N' if the third-party scheduling tool can perform validations for:

- Dependencies between tasks and activities
- Project schedule dates and task schedule dates

You should set P_OP_VALIDATE_FLAG to 'Y' if you are using the APIs to upload data from a legacy system that does not perform an extensive validation for the above. Scheduling data must be validated in order to ensure data integrity in Oracle Projects.

Parameters for CREATE_PROJECT

You can view descriptions of all of the parameters for CREATE_PROJECT in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The parameters for CREATE_PROJECT for which a value is required are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PROJECT_IN

DELETE_PROJECT

DELETE_PROJECT is a PL/SQL procedure used to delete a project and its tasks from Oracle Projects.

Business Rule (project level)

You cannot delete a project if any of these items exist:

- Event
- Expenditure item
- Purchase order distribution
- Purchase order requisition
- Supplier invoice
- Invoice distribution
- Funding
- Budget

- Commitment transaction
- Compensation rule set
- Reference from other project

Business Rule (task level)

You cannot delete a project if any of its tasks cannot be deleted. Use the Check procedure CHECK_DELETE_TASK_OK to see if you can delete a certain task. You cannot delete a task if any of the following exists:

- Event at top task
- Funding at top task
- Budget at top task
- Expenditure item at lowest task
- Purchase order line at lowest task
- Requisition line at lowest task
- Supplier invoice (Oracle Payables invoice) at lowest task
- Budget at lowest task

You can view descriptions of all of the parameters for DELETE_PROJECT in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The parameters for DELETE_PROJECT for which a value is required are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

UPDATE_PROJECT

UPDATE_PROJECT is a PL/SQL procedure that updates project and task information from your external system to Oracle Projects to reflect changes you have made in the external system.

UPDATE_PROJECT uses composite datatypes. For more information about composite datatypes, see APIs That Use Composite Datatypes, page 2-22.

Oracle Projects imposes project- and task-level business rules that restrict the changes you can make to project and task information. To ensure that Oracle Projects accepts all the project or task changes you make in your external system, review the following

rules before you make changes in your external system. You can also use the check procedures, page 3-21 to identify the types of changes that Oracle Projects supports.

Update Mode

The Update Mode parameter has two possible values: PA_UPD_WBS_ATTR and PA_UPD_TASK_ATTR.

A value of PA_UPD_WBS_ATTR has the following effects:

- The workplan version is locked. (You cannot update the version if it is already locked by another user.)
- Users can update task information such as resource, dependencies, schedule and general details.
- Users can make updates to the workplan structure such as creating, deleting, increasing or decreasing indents, moving and copying tasks.

A value of PA_UPD_TASK_ATTR has the following effects:

- The workplan version remains unlocked.
- Users can update task information like dates, dependencies, resources and general details.

Business Rules (Project Level)

Oracle Projects imposes the following business rules.

Project Numbers, Project Names, Project Types, and Project Organizations

The following rules apply to project numbers, names, types, and organizations:

- **Project Number** : You cannot change a project number if expenditure items or invoices have been charged to the project.
    - New project numbers must be unique within Oracle Projects. Use CHECK_UNIQUE_PROJECT_REFERENCE (a Check procedure) to verify that the new project number is unique.
    - If you use an external system to create original project plans, choose manual project numbering. Numbers generated automatically by external systems may not be unique in Oracle Projects and will be replaced by new project numbers generated by Oracle Projects.
- **Project Name:** The new project name must be unique.
- **Project Type:** You cannot change the project type (indirect, capital, or contract) of a project.

- **Project Organization:** You cannot change the project organization if cost distribution lines, draft revenue, or draft invoices have been charged against the project.

Team Members and Customers

The rules for project team members and customers are shown in the following table:

Entity or Topic	Rule
Project manager	A project can have only one active project manager.
New project manager	If you assign a new project manager to an existing project, the default start date for the new project manager is the system date. The default end date for the current project manager is the previous day.
Team members	A project can have any number of team members other than the project manager.
Team member start date	If the start date of a team member other than a project manager is not passed or passed as NULL, the start day is derived from the project start date. When project_start_date is NULL, the default start date for the key member is NULL. It is mandatory for UPDATE_PROJECT that key members have a start date, however. You cannot directly update the start date of an existing key member. To specify a start date for an existing key member, you need to end date the key member with a date prior to the new start date. You can then create a new entry for the key member with a new start date.
Team roles during different periods	UPDATE_PROJECT supports a person performing the same role (other than project manager) for a given project during different periods.
Primary customer	A project can have only one primary customer.
Bill to address ID	Customers can update the bill to address ID of the current bill to customer by passing a valid value for the address. In CREATE_PROJECT or when using UPDATE_PROJECT to create a new customer, if no value is passed for the bill to address, then the primary address for the customer is used.
Ship to address ID	Customers can update the ship to address ID of the current bill to customer by passing a valid value for the address. In CREATE_PROJECT or when using UPDATE_PROJECT to create a new customer, if no value is passed for the ship to address, then the primary address for the customer is used.

Entity or Topic	Rule
Customer bill split for a contract project	Each customer contribution must be a value between 0 and 100. The total of all customer contributions must be 100.
Project relationship code	For a new customer being added, this is a required field. In CREATE_PROJECT, the default relationship is Primary if no value is passed.
Customer bill split for a new customer	For a new customer being added, this is a required field. In CREATE_PROJECT, , if no value is passed, the value 100 is used. The contribution cannot be updated if any revenue or invoices have been charged to the project.
Bill Another Project flag	If a standard invoice has been generated, then this flag cannot be updated.
Receiver task	If the Bill Another Project Flag is not enabled, then this field cannot be updated.

Rules for Project Start and End Dates

The rules for project start and end dates are listed below:

- Project start and completion dates must include the first task start date and the last task completion date for all tasks included in the project.
- You can leave both the start and completion dates or just the completion date blank; however, you must enter a start date if you want to enter a completion date.
- If you change the project status to Closed, then the default completion date is the system date. If you subsequently reopen the project, the default completion date is NULL.
- A NULL value for any of the project fields listed below results in an error message in Oracle Projects. Oracle Projects ignores incoming NULL values for these fields and retains their original values.
    - PROJECT_STATUS
    - PUBLIC_SECTOR_FLAG
    - PROJECT_NUMBER
    - PROJECT_NAME

- CARRYING_OUT_ORGANIZATION_ID
- DISTRIBUTION_RULE for a contract project. (A NULL value for this field raises an error.)

Performing Scheduling Validations

When set to 'N' the P_OP_VALIDATE_FLAG parameter eliminates redundant validation for certain types of scheduling data. Unnecessary scheduling validations can slow system performance.

You should set P_OP_VALIDATE_FLAG to 'N' if you are using this API to integrate a third-party scheduling tool with Oracle Projects. Only set this parameter to 'N' if the third-party scheduling tool can perform validations for:

- Dependencies between tasks and activities
- Project schedule dates and task schedule dates

You should set P_OP_VALIDATE_FLAG to 'Y' if you are using the APIs to upload data from a legacy system that does not perform an extensive validation for the above. Scheduling data must be validated in order to ensure data integrity in Oracle Projects.

Rules for Updating Labor and Non-Labor Billing and Burdening Schedule Attributes for a Project

The rules for updating labor and non-labor schedule attributes are listed below:

- If the labor schedule type is being changed from Bill to Burden or from Burden to Bill, then the column LABOR_SCH_TYPE is required, and all the required dependent columns must be populated.
- If the labor or non-labor schedule type is being changed from Bill to Burden, then the columns REV_IND_RATE_SCH_ID and INV_IND_RATE_SCH_ID are required.
- If the labor schedule type is being changed from Burden to Bill, and Oracle Project Resource Management is installed, then the column JOB_BILL_RATE_SCHEDULE_ID is required.
- If the non-labor schedule type is being changed from Burden to Bill,, then the columns NON_LABOR_BILL_RATE_ORG_ID and NON_LAB_STD_BILL_RT_SCH_ID are required.
- If the LABOR_SCHEDULE_DISCOUNT is passed, then the LABOR_SCHEDULE_DISCOUNT_REASON is also required.
- If the LABOR_SCHEDULE_DISCOUNT is not passed, then the LABOR_SCHEDULE_DISCOUNT_REASON cannot be passed.

- If the NON_LABOR_SCHEDULE_DISCOUNT is passed, then the NON_LABOR_SCHEDULE_DISCOUNT_REASON is also required.
- If the NON_LABOR_SCHEDULE_DISCOUNT is not passed, then the NON_LABOR_SCHEDULE_DISCOUNT_REASON cannot be passed.
- Any schedule ID or organization ID that is passed must be a valid ID.

Business Rules (Task Level)

Oracle Projects imposes the following business rules at the task level.

Order in Which Information is Shared

The following rule applies to the order in which task information is shared between your external system and Oracle Projects:

- You must interface parent tasks to Oracle Projects before you can interface the related child tasks.

Task Numbers, Identification Codes, and Organizations

The following rules apply to task numbers, identification codes, and organizations:

- New task numbers must be unique within a project. Use the Check procedure CHECK_UNIQUE_TASK_NUMBER to verify that a new task number is unique in Oracle Projects.
- If the external system pushes both the TASK_ID and the PM_TASK_REFERENCE to Oracle Projects, Oracle Projects uses the TASK_ID to identify the task and updates PM_TASK_REFERENCE with the incoming value (if different).
- You cannot change a task number if any of the following items have been charged against the task:
  - Expenditure items
  - Purchase order distributions
  - Purchase order requisition distributions
  - Supplier invoices
  - Supplier invoice distributions

    Note: Use the Check procedure CHECK_TASK_NUMBER_CHANGE_OK to verify if Oracle Projects allows you to change the number of a certain task.

- You cannot change a task organization if any of the following items have been charged against the task:
  - Cost distribution lines
  - Revenue distribution lines
  - Draft invoices

Task Start and Finish Dates

The following rules apply to task start and finish dates:

- A task start date must occur:
  - After the parent task start date
  - Before the start date of any subtasks
  - Between the project start and completion dates
- Each task with a completion date must also have a start date.
- A task completion date must occur before the project completion date.

Moving a Task in the WBS

Thes following rules apply to moving a task within a project's work breakdown structure (WBS):

- Because billing, budgeting, and creating capital assets are driven from top tasks, you can move a subtask only if its new parent task belongs to the same top task.
- You cannot change a top task to a subtask.
- You cannot change a subtask to a top task.

Task Attributes

These rules apply to task attributes:

- You cannot change any of the following task attributes to NULL:
  - TASK_NAME
  - PM_TASK_REFERENCE
  - TASK_NUMBER
  - READY_TO_BILL_FLAG

- READY_TO_DISTRIBUTE_FLAG
- CARRYING_OUT_ORGANIZATION_ID
- SERVICE_TYPE_CODE

- You can change the following task attributes without restriction:
  - Task manager
  - Description
  - Other flags (not mentioned previously)
  - Labor and non-labor data
  - Schedules and rates

Updating Labor and Non-Labor Billing and Burdening Schedule Attributes

The rules for updating labor and non-labor schedule attributes for tasks are the same as the corresponding rules for projects. See: Rules for Updating Labor and Non-Labor Billing and Burdening Schedule Attributes for a Project, page 3-14

Parameters for UPDATE_PROJECT

You can view descriptions of all of the parameters for UPDATE_PROJECT in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The parameters for which a value is required for UPDATE_PROJECT are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PROJECT_IN

CLEAR_PROJECT

CLEAR_PROJECT is a Load-Execute-Fetch procedure used to clear the global data structures set up during the Load process.

EXECUTE_CREATE_PROJECT

EXECUTE_CREATE_PROJECT is a Load-Execute-Fetch procedure used to create a project and its tasks using the data stored in the global tables during the Load process.

To populate a project with user-defined attributes, this procedure calls the user-defined attribute procedures. For more information, see: User-Defined Attribute APIs, page 3-85.

Business Rules

Oracle Projects imposes the following business rules.

Performing Scheduling Validations

When set to 'N' the P_OP_VALIDATE_FLAG parameter eliminates redundant validation for certain types of scheduling data. Unnecessary scheduling validations can slow system performance.

You should set P_OP_VALIDATE_FLAG to 'N' if you are using this API to integrate a third-party scheduling tool with Oracle Projects. Only set this parameter to 'N' if the third-party scheduling tool can perform validations for:

- Dependencies between tasks and activities
- Project schedule dates and task schedule dates

You should set P_OP_VALIDATE_FLAG to 'Y' if you are using the APIs to upload data from a legacy system that does not perform an extensive validation for the above. Scheduling data must be validated in order to ensure data integrity in Oracle Projects.

Parameters for EXECUTE_CREATE_PROJECT

You can view descriptions of all of the parameters for EXECUTE_CREATE_PROJECT in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for EXECUTE_CREATE_PROJECT are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

EXECUTE_UPDATE_PROJECT

EXECUTE_UPDATE_PROJECT is a Load-Execute-Fetch procedure used to update an existing project, including changing or adding project data, adding new tasks, and updating existing tasks. This API does not delete tasks; rather, it uses the data stored in the global tables during the Load process.

To update the user-defined attributes in a project, this procedure calls the user-defined attribute procedures. For more information, see: User-Defined Attribute APIs, page 3-85.

Business Rules

Oracle Projects imposes the following business rules.

Performing Scheduling Validations

When set to 'N' the P_OP_VALIDATE_FLAG parameter eliminates redundant validation for certain types of scheduling data. Unnecessary scheduling validations can slow system performance.

You should set P_OP_VALIDATE_FLAG to 'N' if you are using this API to integrate a third-party scheduling tool with Oracle Projects. Only set this parameter to 'N' if the third-party scheduling tool can perform validations for:

- Dependencies between tasks and activities
- Project schedule dates and task schedule dates

You should set P_OP_VALIDATE_FLAG to 'Y' if you are using the APIs to upload data from a legacy system that does not perform an extensive validation for the above. Scheduling data must be validated in order to ensure data integrity in Oracle Projects.

Parameters for EXECUTE_UPDATE_PROJECT

You can view descriptions of all of the parameters for EXECUTE_UPDATE_PROJECT in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for EXECUTE_UPDATE_PROJECT are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

INIT_PROJECT

INIT_PROJECT is a Load-Execute-Fetch procedure used to set up the global data structures. Other Load-Execute-Fetch procedures use the structures to create a new project in Oracle Projects.

LOAD_CLASS_CATEGORY

LOAD_CLASS_CATEGORY is a Load-Execute-Fetch procedure used to load class categories to a global PL/SQL table.

You can view descriptions of all of the parameters for LOAD_CLASS_CATEGORY in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for LOAD_CLASS_CATEGORY are listed below:

- P_API_VERSION_NUMBER
- P_CLASS_CATEGORY (depending on template setup)
- P_CLASS_CODE (if P_CLASS_CATEGORY is not NULL)

LOAD_KEY_MEMBER

LOAD_KEY_MEMBER is a Load-Execute-Fetch procedure used to load key members to a global PL/SQL table.

You can view descriptions of all of the parameters for LOAD_KEY_MEMBER in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for LOAD_KEY_MEMBER are listed below:

- P_API_VERSION_NUMBER
- P_PERSON_ID (depending on template setup)
- P_PROJECT_ROLE_TYPE (ff P_PERSON_ID is not NULL)

LOAD_ORG_ROLE

LOAD_ORG_ROLE is a Load-Execute-Fetch procedure used to load organization roles from the client side to a PL/SQL table on the server side, where the roles will be used by the Load-Execute-Fetch cycle.

You can view descriptions of all of the parameters for LOAD_ORG_ROLE in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual

The required parameters for LOAD_ORG_ROLE are listed below:

- P_API_VERSION_NUMBER
- P_RESOURCE_SOURCE_ID (depending on template setup)
- P_PROJECT_ROLE_TYPE (if P_RESOURCE_SOURCE_ID is not NULL)

LOAD_PROJECT

LOAD_PROJECT is a Load-Execute-Fetch procedure used to load a project to a global PL/SQL record.

You can view descriptions of all of the parameters for LOAD_PROJECT in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual

The required parameters for LOAD_PROJECT are listed below:

- P_API_VERSION_NUMBER
- P_PM_PROJECT_REFERENCE
- P_PROJECT_NAME
- P_CREATED_FROM_PROJECT_ID

The following parameters may be required, depending on the setup of the project template:

- P_CARRYING_OUT_ORGANIZATION_ID
- P_PUBLIC_SECTOR_FLAG
- P_PROJECT_STATUS_CODE
- P_DESCRIPTION
- P_START_DATE
- P_COMPLETION_DATE
- P_DISTRIBUTION_RULE
- P_CUSTOMER_ID
- P_PROJECT_RELATIONSHIP_CODE

Check Procedures

The following check procedures are PL/SQL procedures used to verify in real time that:

- Project information you have entered into your external system is unique in Oracle Projects
- Certain functions, such as deleting a project, follow the business rules defined in Oracle Projects

CHECK_CHANGE_PROJECT_ORG_OK

Use the Check procedure CHECK_CHANGE_PROJECT_ORG_OK to determine if you can change the CARRYING_OUT_ORGANIZATION_ID field for a particular project or task.

You can view descriptions of all of the parameters for CHECK_CHANGE_PROJECT_ORG_OK in the Oracle Integration Repository. The

Oracle Integration Repository is described in the preface of this manual.

The required parameters for CHECK_CHANGE_PROJECT_ORG_OK are listed below:

- P_API_VERSION_NUMBER

CHECK_DELETE_PROJECT_OK

Use the Check procedure CHECK_DELETE_PROJECT_OK to determine if you can delete a project.

You can view descriptions of all of the parameters for CHECK_DELETE_PROJECT_OK in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for CHECK_DELETE_PROJECT_OK are listed below:

- P_API_VERSION_NUMBER

CHECK_UNIQUE_PROJECT_REFERENCE

Use the Check procedure CHECK_UNIQUE_PROJECT_REFERENCE to determine if a new or changed project reference (PM_PROJECT_REFERENCE) is unique.

You can view descriptions of all of the parameters for CHECK_UNIQUE_PROJECT_REFERENCE in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for CHECK_UNIQUE_PROJECT_REFERENCE are listed below:

- P_API_VERSION_NUMBER

Project Definition Record and Table Datatypes

The record and table datatypes used in the APIs are defined on the following pages.

PROJECT_IN_REC_TYPE Datatype

The following table shows the PROJECT_IN_REC_TYPE datatype.

Name	Type	Required?	Description
PM_PROJECT_REFERENCE	VARCHAR2 (25)	Yes	Code for the project in the external system. See Examples and Remarks, page 3-7.

Name	Type	Required?	Description
PA_PROJECT_ID	NUMBER (15)	For update	The reference code that uniquely identifies the project in Oracle Projects
PA_PROJECT_NUMBER	VARCHAR2 (25)	No	The project number that uniquely identifies the project in Oracle Projects
PROJECT_NAME	VARCHAR2 (30)	Yes	Unique name of the project uniquely identifies the project in Oracle Projects
LONG_NAME	VARCHAR2 (240)	No	Project long name
CREATED_FROM _PROJECT_ID	NUMBER (15)	Yes	Number that uniquely identifies the template from which this project originates
CARRYING_OUT _ORGANIZATION_ID	NUMBER (15)	Based on template setup	The identification code of the organization responsible for the project work
PUBLIC_SECTOR_FLAG	VARCHAR2 (1)	Based on template setup	Flag that indicates whether this project is in the Public or the Private sector
PROJECT_STATUS_CODE	VARCHAR2 (30)	Based on template setup	The status of the project. Any status other than CLOSED is considered active.
DESCRIPTION	VARCHAR2 (250)	Based on template setup	The description of the project
START_DATE	DATE	Based on template setup	The date on which the project starts
COMPLETION_DATE	DATE	Based on template setup	The date on which the project is completed
DISTRIBUTION_RULE	VARCHAR2 (30)	Based on template setup	The distribution rule that specifies the contract project's revenue accrual and billing method

Name	Type	Required?	Description
CUSTOMER_ID	NUMBER (15)	Based on template setup	The identification code of the project's customer
PROJECT_RELATIONSHIP_CODE	VARCHAR2 (30)	Yes	The type of customer relationship the customer has on the project
ACTUAL_START_DATE	DATE	No	The actual project start date in the external system
ACTUAL_FINISH_DATE	DATE	No	The actual project finish date in the external system
EARLY_START_DATE	DATE	No	The early project start date in the external system
EARLY_FINISH_DATE	DATE	No	The early project finish date in the external system
LATE_START_DATE	DATE	No	The late project start date in the external system
LATE_FINISH_DATE	DATE	No	The late project finish date in the external system
SCHEDULED_START_DATE	DATE	No	The scheduled project start date in the external system
SCHEDULED_FINISH_DATE	DATE	No	The scheduled project finish date in the external system
ATTRIBUTE_CATEGORY	VARCHAR2 (30)	No	Used by descriptive flexfields
ATTRIBUTE1 THROUGH ATTRIBUTE10	VARCHAR2 (150)	No	Descriptive flexfield
OUTPUT_TAX_CODE	VARCHAR2 (30)	No	Indicates whether tax rate defined for the Project will be used for Customer Invoices.

Name	Type	Required?	Description
RETENTION_TAX_CODE	VARCHAR2 (30)	No	Indicates whether tax rate defined for the Retention will be used for Customer Invoices.
PROJECT_CURRENCY _CODE	VARCHAR2 (15)	No	Project currency code. The default value is the currency code of the ledger.
ALLOW_CROSS_CHARGE _FLAG	VARCHAR2 (1)	No	Cross charge allowed? Value is required. Default Value is N. This value can be overridden at any task level.
PROJECT_RATE_DATE	DATE	No	Default project currency rate date (date for accounting currency rate for a given rate type).
PROJECT_RATE_TYPE	VARCHAR2 (30)	No	Default project currency rate type (e.g., Spot, Corporate).
CC_PROCESS_LABOR _FLAG	VARCHAR2 (1)	No	Flag that indicates cross charge processing is to be performed for labor transactions charged to the project. Default value for the project template is N. This is defaulted to a project from the project template.
LABOR_TP_SCHEDULE_ID	NUMBER	No	Identifier for transfer price schedule for cross charged labor transactions. This is defaulted to a project from the project template. If cc_process_labor_flag is set to Y, this field is required.
LABOR_TP_FIXED_DATE	DATE	No	Fixed date to find the effective rate of the bill rate or burden schedule when determining the transfer price for labor transactions. This is defaulted to a project from the project template. This value for the project is default for the task fixed date. If cc_process_labor flag is set to Y, this field is required.
CC_PROCESS_NL_FLAG	VARCHAR2 (1)	No	Flag that indicated cross charge processing is to be performed for non-labor transactions charged to the project. Defaulted value for the project template is N. This is defaulted to a project from the project template.

Name	Type	Required?	Description
NL_TP_SCHEDULE_ID	NUMBER	No	Identifier for transfer price schedule for cross charged non-transactions. This is defaulted to a project from the project template. If cc_process_nl_labor flag is set to Y, this field is required.
NL_TP_FIXED_DATE	DATE	No	Fixed date to find the effective rate of the bill rate or burden schedule when determining the transfer price for non-labor transactions. This is defaulted to a project from the project template. If cc_process_nl_flag is set toY, this field is required.
CC_TAX_TASK_ID	NUMBER	No	Identifier of the task to which intercompany tax items on the intercompany AP invoice are charged.
ROLE_LIST_ID	NUMBER (15)	No	Identifier of the role list, a list of allowable roles that are displayed when team members are assigned
WORK_TYPE_ID	NUMBER (15)	No	Work type identifier. Work types are predefined types of work. For example, Vacation, Training, and Administration.
CALENDAR_ID	NUMBER (15)	No	Calendar identifier. A calendar specifies exceptions such as public holidays.
LOCATION_ID	NUMBER (15)	No	Identifier of the project work site location
PROBABILITY_MEMBER_ID	NUMBER (15)	No	Identifier of the probability member. Project probability, the likelihood that a project will be approved, is used as a weighting average for reporting.
PROJECT_VALUE	NUMBER	No	The opportunity value converted to the project functional currency
EXPECTED_APPROVAL _DATE	DATE	No	The expected date of the project approval (for information purposes only)

Name	Type	Required?	Description
COST_JOB_GROUP_ID	NUMBER	No	Identifier of the job group for costing functionality
BILL_JOB_GROUP_ID	NUMBER	No	Identifier of the job group for billing functionality
TEAM_TEMPLATE_ID	NUMBER (15)	No	The team template that you want to add to a new project
COUNTRY_CODE	VARCHAR2 (250)	No	Country name code
REGION	VARCHAR2 (250)	No	Region
CITY	VARCHAR2 (250)	No	City
EMP_BILL_RATE _SCHEDULE_ID	NUMBER	No	The identifier of the employee-based bill rate schedule for the project
JOB_BILL_RATE _SCHEDULE_ID	NUMBER	No	The identifier of the job-based bill rate schedule for the project
INVPROC_CURRENCY_TYPE	VARCHAR2 (30)	No	Invoice processing currency code
REVPROC_CURRENCY _CODE	VARCHAR2 (15)	No	Revenue processing currency code in the project functional currency
PROJECT_BIL_RATE _DATE_CODE	VARCHAR2 (30)	No	Exchange rate date type for converting customer billing amounts from bill transaction currency or funding currency to project currency

Name	Type	Required?	Description
PROJECT_BIL_RATE_TYPE	VARCHAR2 (30)	No	Exchange rate type for converting customer billing amounts from bill transaction currency or funding currency to project currency
PROJECT_BIL_RATE_DATE	DATE	No	Exchange rate date for converting customer billing amounts from bill transaction currency or funding currency to project currency, if the rate date type is Fixed.
PROJECT_BIL_EXCHANGE_RATE	NUMBER	No	Exchange rate for conversion from bill transaction currency or funding currency to project currency if the rate type is User
PROJFUNC_CURRENCY_CODE	VARCHAR2 (15)	No	Project functional currency. The default value is the value entered for the associated ledger.
PROJFUNC_BIL_RATE_DATE_CODE	VARCHAR2 (30)	No	Exchange rate date type for converting customer billing amounts from bill transaction currency or funding currency to project functional currency
PROJFUNC_BIL_RATE_TYPE	VARCHAR2 (30)	No	Exchange rate type for converting customer billing amounts from bill transaction currency or funding currency to project functional currency
PROJFUNC_BIL_RATE_DATE	DATE	No	Exchange rate date for converting customer billing amounts from bill transaction currency or funding currency to project functional currency if the rate date type is Fixed
PROJFUNC_BIL_EXCHANGE_RATE	NUMBER	No	Exchange rate for conversion from bill transaction currency or funding currency to project functional currency if the rate type is User
FUNDING_RATE_DATE_CODE	VARCHAR2 (30)	No	Exchange rate date type for conversting customer billing amounts from bill transaction currency to funding currency
FUNDING_RATE_TYPE	VARCHAR2 (30)	No	Exchange rate type for converting customer billing amounts from bill transaction currency to funding currency

Name	Type	Required?	Description
FUNDING_RATE_DATE	DATE	No	Exchange rate date for converting customer billing amounts from bill transaction currency to funding currency if rate date type is Fixed
FUNDING_EXCHANGE_RATE	NUMBER	No	Exchange rate for conversion from bill transaction currency to project or functional currency if rate type is User
BASELINE_FUNDING_FLAG	VARCHAR2 (1)	No	Flag that indicates whether the funding can be baselined without a revenue budget
MULTI_CURRENCY_BILLING_FLAG	VARCHAR2 (1)	No	Flag that indicates whether multi-currency billing is allowed for the project
COMPETENCE_MATCH_WT	NUMBER	No	The weighting value for competence match, used to calculate the score
AVAILABILITY_MATCH_WT	NUMBER	No	The weighting value for availability match, used to calculate the score
JOB_LEVEL_MATCH_WT	NUMBER	No	The weighting value for job-level match, used to calculate the score
ENABLE_AUTOMATED_SEARCH	VARCHAR2 (1)	No	Flag that indicates whether automated candidate nomination is used for the requirements on a project
SEARCH_MIN_AVAILABILITY	NUMBER	No	The minimum required availability for a resource to be returned in the search result
SEARCH_ORG_HIER_ID	NUMBER (15)	No	Organization hierarchy for searches
SEARCH_STARTING_ORG_ID	NUMBER (15)	No	Starting organization for searches

Name	Type	Required?	Description
SEARCH_COUNTRY_ID	VARCHAR2 (2)	No	Country for the search
MIN_CAND_SCORE_REQD _FOR_NOM	NUMBER	No	Minimum score required for a resource to be nominated as candidate on a requirement
MAX_NUM_OF_SYS_NOM _CAND	NUMBER	No	Maximum number of candidates that can be nominated
NON_LAB_STD_BILL_RT _SCH_ID	NUMBER (15)	No	Identifier of the non-labor standard bill rate schedule
SEARCH_COUNTRY_CODE	VARCHAR2 (2)	No	Country for searches
INV_BY_BILL_TRANS _CURR_FLAG	VARCHAR2 (1)	No	Flag that indicates whether invoicing is by bill transaction currency for the project
PROJFUNC_COST_RATE _TYPE	VARCHAR2 (30)	No	Default value for the project functional cost rate
PROJFUNC_COST_RATE _DATE	DATE	No	Default value for the project functional cost rate date
ASSIGN_PRECEDES_TASK	VARCHAR2 (1)	No	Flag that indicates whether assignment level attributes override task level attributes
SPLIT_COST_FROM _WORKPLAN_FLAG	VARCHAR2 (1)	No	Flag indicating whether split cost from workplan is permitted
SPLIT_COST_FROM_BILL _FLAG	VARCHAR2 (1)	No	Flag indicating whether split cost from bill is permitted
ADV_ACTION_SET_ID	NUMBER (15)	No	Flag that indicates the default advertisement action set of the project or project template

Name	Type	Required?	Description
START_ADV_ACTION_SET_FLAG	VARCHAR2 (1)	No	Flag that indicates whether the advertisement action set will start immediately after a requirement is created
PRIORITY_CODE	VARCHAR2 (30)	No	The code identifying the priority of the project
RETN_BILLING_INV_FORMAT_ID	NUMBER (15)	No	The identifier of the retention billing invoice format
RETN_ACCOUNTING_FLAG	VARCHAR2 (1)	No	Flag that indicates whether retention accounting is enabled for the project
OPP_VALUE_CURRENCY_CODE	VARCHAR2 (15)	No	The currency code for project opportunity value
REVALUATE_FUNDING_FLAG	VARCHAR2 (1)	No	Flag that indicates whether the funding has to be revaluated
INCLUDE_GAINS_LOSSES_FLAG	VARCHAR2 (1)	No	Flag that indicates whether gains and losses to be included in project revenue
SECURITY_LEVEL	NUMBER	No	Indicator showing whether a project is public or private. A value of 101 (secured) indicates that the project is private. A value of 1 (enterprise) indicates that the project is public.
LABOR_DISC_REASON_CODE	VARCHAR2 (30)	No	Reason code for labor discount
NON_LABOR_DISC_REASON_CODE	VARCHAR2 (30)	No	Reason code for non-labor discount
LABOR_SCHEDULE_FIXED_DATE	DATE	For update	The date used to determine the effective bill rates when using the labor bill rate schedule

Name	Type	Required?	Description
LABOR_SCHEDULE _DISCOUNT	DATE	For update	The discount for the labor bill rate schedule
NON_LABOR_BILL_RATE _ORG_ID	NUMBER	For update	The identifier of the organization attached to the non-labor bill rate schedule
NON_LABOR_SCHEDULE _FIXED_DATE	DATE	For update	The date when the schedule will become effective
NON_LABOR_SCHEDULE _DISCOUNT	DATE	For update	The discount for the non-labor bill rate schedule
REV_IND_RATE_SCH_ID	NUMBER	For update	The identifier of the revenue schedule
INV_IND_RATE_SCH_ID	NUMBER	For update	The identifier of the invoice schedule
REV_IND_SCH_FIXED_DATE	DATE	For update	The start date of the revenue schedule for a burden schedule of the type Firm
INV_IND_SCH_FIXED_DATE	DATE	For update	The start date of the invoice schedule for a burden schedule of the type Firm
LABOR_SCH_TYPE	VARCHAR (1)	For update	The schedule type (Burden or Bill) for labor expenditure items
NON_LABOR_SCH_TYPE	VARCHAR (1)	For update	The schedule type (Burden or Bill) for non-labor expenditure items
ASSET_ALLOCATION _METHOD	VARCHAR2 (30)	No	The method used to allocate indirect and common costs across the assets assigned to a grouping level
CAPITAL_EVENT _PROCESSING	VARCHAR2 (30)	No	The capital event processing method, used to determine when cost and assets are grouped for capitalization or retirement adjustment processing

Name	Type	Required?	Description
CINT_RATE_SCH_ID	NUMBER (15)	No	Identifier of the capital interest rate schedule
CINT_ELIGIBLE_FLAG	VARCHAR2 (1)	No	Flag that indicates whether the project is eligible for capitalized interest
CINT_STOP_DATE	DATE	No	Stop date for capital interest calculation
BILL_TO_CUSTOMER_ID	NUMBER	No	Identifier of the bill to customer name
SHIP_TO_CUSTOMER_ID	NUMBER	No	Identifier of the ship to customer name
PROCESS_MODE	VARCHAR2 (30)	No	Processing mode. Indicates whether task processing should be done online or using a concurrent request
SYS_PROGRAM_FLAG	VARCHAR2 (1)	No	Flag indicating whether the project can be treated as a program
ENABLE_TOP_TASK _CUSTOMER_FLAG	VARCHAR2 (1)	No	Flag indicating whether customer at top task is enabled for the project
ENABLE_TOP_TASK_INV _MTH_FLAG	VARCHAR2 (1)	No	Flag indicating whether the invoice method at top task is enabled for the project
PROJFUNC_ATTR_FOR _AR_FLAG	VARCHAR2 (1)	No	
BILL_TO_ADDRESS_ID	NUMBER (15)	No	Identifier of the bill to customer address
SHIP_TO_ADDRESS_ID	NUMBER (15)	No	Identifier of the ship to customer address

PROJECT_OUT_REC_TYPE Datatype

The following table shows the PROJECT_OUT_REC_TYPE datatype.

Name	Type	Description
PA_PROJECT_ID	NUMBER (15)	The reference code that uniquely identifies the project in Oracle Projects
PA_PROJECT _NUMBER	VARCHAR2 (25)	The number that uniquely identifies the project in Oracle Projects
RETURN_STATUS	VARCHAR2 (1)	API standard

PROJECT_ROLE_TBL_TYPE Datatype

The following table shows the PROJECT_ROLE_TBL_TYPE datatype.

Name	Type	Required?	Description
PERSON_ID	NUMBER (9)	Based on template setup	The identifier of the person
PROJECT_ROLE _TYPE	VARCHAR2 (20)	Yes, if PERSON_ID is not NULL	The type of role that the person has on the project
START_DATE	DATE	No	The date when the role begins for the person. Default value is the project start date.
END_DATE	DATE	No	The date when the role ends for the person

CLASS_CATEGORY_TBL_TYPE Datatype

The following table shows the CLASS_CATEGORY_TBL_TYPE datatype.

Name	Type	Required?	Description
CLASS_CATEGORY	VARCHAR2 (30)	Based on template setup	The class category of the project

Name	Type	Required?	Description
CLASS_CODE	VARCHAR2 (30)	Yes, if CLASS_CATEGORY is not NULL	The class code of the project
CODE_PERCENTAGE	NUMBER	No	Class category percentage
NEW_CLASS_CODE	VARCHAR2 (30)	No	The new class code to replace the existing CLASS_CODE. If the project is not already assigned a CLASS_CODE, this parameter is ignored.

TASK_IN_TBL_TYPE Datatype

The following table shows the TASK_IN_TBL_TYPE datatype.

Note: If you are using this datatype to update tasks for an existing project, you must include the entire WBS structure in the correct hierarchy.

Name	Type	Required	Description
PM_TASK_REFERENCE	VARCHAR2 (25)	Yes, or PA_TASK_ID is used	The identifier of the task in the external system
PA_TASK_ID	NUMBER (15)	For update	The reference code that uniquely identifies a task within a project in Oracle Projects
TASK_NAME	VARCHAR2 (20)	Yes	The name that uniquely identifies a task within a project
PA_TASK_NUMBER	VARCHAR2 (25)	Yes	The number that identifies the task in Oracle Projects. Intended for systems that maintain a task number in addition to a unique task reference.
TASK_DESCRIPTION	VARCHAR2 (250)	No	Description of the task

Name	Type	Required	Description
TASK_START_DATE	DATE	No	The date on which the task starts
TASK_COMPLETION_DATE	DATE	No	The date on which the task is completed
PM_PARENT_TASK_REFERENCE	VARCHAR2 (25)	No	The reference code that identifies the task's parent task in the external system
PA_PARENT_TASK_ID	NUMBER	For update	The identification code of the task's parent task in Oracle Projects
ADDRESS_ID	NUMBER	No	The address of one of the customers logically linked to this task
CARRYING_OUT_ORGANIZATION_ID	NUMBER (15)	No	The identification code of the organization responsible for the task work. The task organization defaults to the project organization upon creation of the task.
SERVICE_TYPE_CODE	VARCHAR2 (30)	No	The type of work performed on the task
TASK_MANAGER_PERSON_ID	NUMBER (9)	No	The identification code of the employee who manages the task. NOTE: To ensure that the task manager has been defined in Oracle Projects, use a list of values (pa_task_managers_lov_v) to select a task manager's person identification code.
BILLABLE_FLAG	VARCHAR2 (1)	No	Default flag for items charged to the task that indicates if the item can accrue revenue (Y or N)
CHARGEABLE_FLAG	VARCHAR2 (1)	No	Flag that indicates if expenditure items can be charged to the task. Only lowest tasks are chargeable.
READY_TO_BILL_FLAG	VARCHAR2 (1)	No	Flag that indicates whether the task is authorized to be invoiced

Name	Type	Required	Description
READY_TO _DISTRIBUTE_FLAG	VARCHAR2 (1)	No	Flag that indicates whether the task is authorized for revenue accrual
LIMIT_TO_TXN _CONTROLS_FLAG	VARCHAR2 (1)	No	Flag that indicates that users can charge to the task only those expenditures listed in the task's transaction controls
LABOR_BILL_RATE _ORG_ID	NUMBER (15)	No	The identification code of the organization that owns the labor standard bill rate schedule
LABOR_STD_BILL _RATE_SCHDL	VARCHAR2 (20)	No	The labor standard bill rate schedule used to calculate revenue for labor expenditure items charged to the task
LABOR_SCHEDULE _FIXED_DATE	DATE	No	The date used to determine the effective bill rates of the task standard labor bill rate schedule
LABOR_SCHEDULE _DISCOUNT	NUMBER (7,4)	No	The percentage to be discounted from the task standard labor bill rate schedule
NON_LABOR_BILL _RATE_ORG_ID	NUMBER (15)	No	The identification code of the organization that owns the non-labor standard bill rate schedule
NON_LABOR_STD _BILL_RATE_SCHDL	VARCHAR2 (30)	No	The non-labor standard bill rate schedule used to calculate revenue for non-labor expenditure items charged to the task
NON_LABOR _SCHEDULE_FIXED _DATE	DATE	No	The fixed date used to determine the effective bill rates of the standard non-labor bill rate schedule
NON_LABOR _SCHEDULE_DISCOUNT	NUMBER (7,4)	No	The percentage to be discounted from the task standard non-labor bill rate schedule
LABOR_COST _MULTIPLIER_NAME	VARCHAR2 (20)	No	The labor cost multiplier defined for the task of a premium project. The labor cost multiplier is populated for all overtime expenditure items charged to the task.

Name	Type	Required	Description
COST_IND_RATE _SCH_ID	NUMBER (15)	No	The identification code of the default costing burden schedule
REV_IND_RATE_SCH_ID	NUMBER (15)	No	The identification code of the default revenue burden schedule
INV_IND_RATE_SCH_ID	NUMBER (15)	No	The identification code of the default invoice burden schedule
COST_IND_SCH _FIXED_DATE	DATE	No	The scheduled fixed date of the firm costing burden schedule
REV_IND_SCH_FIXED _DATE	DATE	No	The scheduled fixed date of the firm revenue burden schedule
INV_IND_SCH_FIXED _DATE	DATE	No	The scheduled fixed date of the firm invoice burden schedule
LABOR_SCH_TYPE	VARCHAR2 (1)	No	The scheduled type of labor expenditure items
NON_LABOR_SCH _TYPE	VARCHAR2 (1)	No	The scheduled type of non-labor expenditure items
ACTUAL_START_DATE	DATE	No	The actual start date of the project in the external system
ACTUAL_FINISH_DATE	DATE	No	The actual finish date of the project in the external system
EARLY_START_DATE	DATE	No	The early start date of the project in the external system
EARLY_FINISH_DATE	DATE	No	The early finish date of the project in the external system
LATE_START_DATE	DATE	No	The late start date of the project in the external system

Name	Type	Required	Description
LATE_FINISH_DATE	DATE	No	The late finish date of the project in the external system
SCHEDULED_START_DATE	DATE	No	The scheduled start date of the project in the external system
SCHEDULED_FINISH_DATE	DATE	No	The scheduled finish date of the project in the external system
ALLOW_CROSS_CHARGE_FLAG	VARCHAR2 (1)	No	Cross charge allowed? Value is required. Default Value is N. This value can be overridden at any task level.
PROJECT_RATE_DATE	DATE	No	Default project currency rate date (date for accounting currency rate for a given rate type).
PROJECT_RATE_TYPE	VARCHAR2 (30)	No	Default project currency rate type (e.g., Spot, Corporate).
CC_PROCESS_LABOR_FLAG	VARCHAR2 (1)	No	Flag that indicates cross charge processing is to be performed for labor transactions charged to the project. Default value for the project template is N. This is defaulted to a project from the project template.
LABOR_TP_SCHEDULE_ID	NUMBER	No	Identifier for transfer price schedule for cross charged labor transactions. This is defaulted to a project from the project template. If cc_process_labor_flag is set to Y, this field is required.
LABOR_TP_FIXED_DATE	DATE	No	Fixed date to find the effective rate of the bill rate or burden schedule when determining the transfer price for labor transactions. This is defaulted to a project from the project template. This value for the project is default for the task fixed date. If CC_PROCESS_NL_FLAG is set to Y, this field is required.

Name	Type	Required	Description
CC_PROCESS_NL _FLAG	VARCHAR2 (1)	No	Flag that indicated cross charge processing is to be performed for non-labor transactions charged to the project. Default value for the project template is N. This is defaulted to a project from the project template.
NL_TP_SCHEDULE _ID	NUMBER	No	Identifier for transfer price schedule for cross charged non-transactions. This is defaulted to a project from the project template. If CC_PROCESS_NL_FLAG is set to Y, this field is required.
NL_TP_FIXED_DAT	DATE	No	Fixed date to find the effective rate of the bill rate or burden schedule when determining the transfer price for non-labor transactions. This is defaulted to a project from the project template. If CC_PROCESS_NL_FLAG is set to Y, this field is required.
RECEIVE_PROJECT _INVOICE_FLAG	VARCHAR2 (1)	No	Flag that indicates that the task may receive charges from internal suppliers via inter-project billing.
ATTRIBUTE_CATEGORY	VARCHAR2 (30)	No	Used by descriptive flexfields
ATTRIBUTE1 THROUGH ATTRIBUTE10	VARCHAR2 (150)	No	Descriptive flexfield
P_JOB_BILL_RATE _SCHEDULE_ID	NUMBER	No	The identifier of the job-based bill rate schedule for the project
P_EMP_BILL_RATE _SCHEDULE_ID	NUMBER	No	The identifier of the employee-based bill rate schedule for the project
P_TASKFUNC_COST _RATE_TYPE	VARCHAR2 (30)	No	The task-level default value for project functional cost rate type
P_TASKFUNC_COST _RATE_DATE	DATE	No	The task-level default value for project functional cost rate date

Name	Type	Required	Description
P_NON_LAB_STD _BILL_RT_SCH_ID	NUMBER (15)	No	Identifier of the non-labor standard bill rate schedule
P_LABOR_DISC _REASON_CODE	VARCHAR2 (30)	No	Reason code for labor discount
P_NON_LABOR_DISC _REASON_CODE	VARCHAR2 (30)	No	Reason code for non-labor discount
P_LONG_TASK_NAME	VARCHAR2 (240)	No	Task long name
P_RETIREMENT_COST _FLAG	VARCHAR2 (1)	No	Flag that identifies tasks for retirement cost collection
P_CINT_ELIGIBLE_FLAG	VARCHAR2 (1)	No	Flag that indicates whether the project is eligible for capitalized interest
P_CINT_STOP_DATE	DATE	No	Stop date for capital interest calculation
P_REVENUE_ACCRUAL _METHOD	VARCHAR2 (30)	No	The revenue accrual method for task
P_INVOICE_METHOD	VARCHAR2 (30)	No	The invoice method for the task
P_OBLIGATION_START _DATE	DATE	No	The obligation start date of the workplan version
P_OBLIGATION_FINISH _DATE	DATE	No	The obligation finish date of the workplan version
P_ACTUAL_START _DATE	DATE	No	The actual start date of the workplan version

Name	Type	Required	Description
P_ACTUAL_FINISH_DATE	DATE	No	The actual end date of the workplan version
P_ESTIMATED_START_DATE	DATE	No	The estimated start date of the workplan version
P_ESTIMATED_FINISH_DATE	DATE	No	The estimated finish date of the workplan version
P_EARLY_START_DATE	DATE	No	The early start date of the workplan version
P_EARLY_FINISH_DATE	DATE	No	The early finish date of the workplan version
P_LATE_START_DATE	DATE	No	The late start date of the workplan version
P_LATE_FINISH_DATE	DATE	No	The late finish date of the workplan version
P_MILESTONE_FLAG	VARCHAR2 (1)	No	Flag that indicates if the task version is a milestone. This is a task-specific attribute.
P_CRITICAL_FLAG	VARCHAR2 (1)	No	Flag that indicates if the task version is part of the critical path. This is a task-specific attribute.
P_WQ_PLANNED_QUANTITY	NUMBER (17)	No	The planned work quantity for the task
P_PLANNED_EFFORT	NUMBER (17)	No	The planned effort for the task

TASK_OUT_TBL_TYPE Datatype

The following table shows the TASK_OUT_TBL_TYPE datatype.

Name	Type	Description
PA_TASK_ID	NUMBER (15)	The code that uniquely identifies a task in a project in Oracle Projects
PM_TASK_REFERENCE	VARCHAR2 (25)	The reference code that identifies a project's task in the external system
RETURN_STATUS	VARCHAR2 (1)	API standard
TASK_VERSION_ID	NUMBER	Task Version ID

TASK_IN_REC_TYPE Datatype

The following table shows the TASK_IN_REC_TYPE datatype.

Name	Type	Req?	Description
RETIREMENT_COST _FLAG	VARCHAR2 (1)	No	Flag that identifies tasks for retirement cost collection
CINT_ELIGIBLE_FLAG	VARCHAR2 (1)	No	Flag that indicates whether the project is eligible for capitalized interest
CINT_STOP_DATE	DATE	No	Stop date for capital interest calculation
PRED_STRING	VARCHAR2 (4000)	Yes	The string containing the predecessors information
PRED_DELIMITER	VARCHAR2 (1)	Yes	Delimiter that separates predecessors in the predecessor string
BASE_PERCENT _COMP_DERIV_CODE	VARCHAR2 (30)	Yes	Base percent complete derivation code for the task

Name	Type	Req?	Description
SCH_TOOL_TSK _TYPE_CODE	VARCHAR2 (30)	Yes	Default scheduling tool task type for the task version
CONSTRAINT_TYPE _CODE	VARCHAR2 (30)	Yes	Constraint type for the task version
CONSTRAINT_DATE	DATE	Yes	Constraint date for the task version
FREE_SLACK	NUMBER	Yes	Free slack for the task version
TOTAL_SLACK	NUMBER	Yes	Total slack for the task version
EFFORT_DRIVEN_FLAG	VARCHAR2 (1)	Yes	The flag that indicates whether the task is effort driven
LEVEL_ASSIGNMENTS _FLAG	VARCHAR2 (1)	Yes	The flag that indicates whether the assignments on this task should be leveled
INVOICE_METHOD	VARCHAR2 (30)	Yes	The invoice method for the task. Valid only for top tasks with Invoice Method enabled.
CUSTOMER_ID	NUMBER	Yes	The customer for the task. Valid only for top tasks with Customer enabled.
GEN_ETC_SOURCE _CODE	VARCHAR2 (30)	Yes	Estimate to complete source
FINANCIAL_TASK_FLA G	VARCHAR2 (1)	Yes	The flag that indicates whether the task is a financial task or not. This flag is valid only for partially shared structures. Tasks that are above this level are used for financial management.
MAPPED_TASK_ID	NUMBER	Yes	Mapped task ID
MAPPED_TASK _REFERENCE	VARCHAR2 (150)	Yes	Mapped task reference

Name	Type	Req?	Description
DELIVERABLE	VARCHAR2 (4000)	No	Deliverable reference to be associated with the task
DELIVERABLE_ID	NUMBER		Identification code of the deliverable associated with the task
EXT_ACT_DURATION	NUMBER	Yes	From the external application, the actual duration
EXT_REMAIN _DURATION	NUMBER	Yes	From the external application, the remaining duration
EXT_SCH_DURATION	NUMBER	Yes	From the external application, the scheduled duration
ETC_EFFORT	NUMBER	Yes	Estimated remaining effort for the task
PERCENT_COMPLETE	NUMBER	Yes	Percentage of work complete on the task

CUSTOMER_TBL_TYPE Datatype

This record type enables the user to pass multiple customers to the UPDATE_PROJECT API. The following table shows the CUSTOMER_TBL_TYPE datatype.

Name	Type	Req?	Description
CUSTOMER_ID	NUMBER (15)	Based on template setup	The identifier of the project customer
PROJECT_ RELATIONSHIP_CODE	VARCHAR2 (30)	Yes	The identifier of the customer relationship type that the customer has with the project
BILL_TO_CUSTOMER_ID	NUMBER (15)	No	The identifier of the customer to whom invoices are sent
SHIP_TO_CUSTOMER_ID	NUMBER (15)	No	The identifier of the customer that is the project customer's default work site for the project

Name	Type	Req?	Description
BILL_TO_ADDRESS_ID	NUMBER (15)	No	The identifier of the customer address to which invoices are sent
SHIP_TO_ADDRESS_ID	NUMBER (15)	No	The identifier of the customer address that is the project customer's default work site for the project
CONTACT_ID	NUMBER (15)	No	The identifier of the contact who represents the customer for the project
PROJECT_CONTACT _TYPE_CODE	VARCHAR2 (30)	No	The contact type that classifies the contact
CUSTOMER_BILL_SPLIT	NUMBER (8)	Yes	The percentage of the total project revenue and invoice that the customer is charged
ALLOW_INV_USER _RATE_TYPE_FLAG	VARCHAR2 (1)	No	Flag indicating whether the User exchange rate type is permitted for the customer on the project.
INV_RATE_DATE	DATE	No	The default invoice currency exchange rate date for draft invoices generated for this project customer
INV_RATE_TYPE	VARCHAR2 (30)	No	Default invoice currency exchange rate type for draft invoices generated for this project customer
INV_CURRENCY_CODE	VARCHAR2 (15)	Yes	Default invoice currency code for draft invoices generated for this project customer
INV_EXCHANGE_RATE	NUMBER	No	Default invoice currency exchange rate for draft invoices generated for this project customer
BILL_ANOTHER _PROJECT_FLAG	VARCHAR2 (1)	No	Flag indicating whether the project customer is internal

Name	Type	Req?	Description
RECEIVER_TASK_ID	NUMBER	No	Task identifier of the receiver task that is linked to the internal project customer

DELIVERABLE_IN_REC_TYPE

The following table shows the DELIVERABLE_IN_REC_TYPE datatype.

Name	Type	Required?	Description
DELIVERABLE_SHORT_NAME	VARCHAR2 (100)	Yes	Short name of the deliverable
DELIVERABLE_NAME	VARCHAR2 (240)	Yes	Long name of the deliverable
DESCRIPTION	VARCHAR2 (2000)	No	Description of the deliverable
DELIVERABLE_OWNER_ID	NUMBER	No	ID of the deliverable owner
STATUS_CODE	VARCHAR2 (30)	No	Status of the deliverable
DELIVERABLE_TYPE_ID	NUMBER	No	ID of the deliverable type
PROGRESS_WEIGHT	NUMBER	No	Progress weight of the deliverable
DUE_DATE	DATE	No	Deliverable due date
COMPLETION_DATE	DATE	No	Deliverable completion date
PM_SOURCE_CODE	VARCHAR2 (30)	No	Identifier of the external system
PM_DELIVERABLE_REFERENCE	VARCHAR2 (25)	Yes	The unique identifier of the deliverable in the external system

Name	Type	Required?	Description
DELIVERABLE_ID	NUMBER	Yes	The unique identifier of the deliverable in Oracle Projects
TASK_ID	NUMBER	No	The task ID of the task where the deliverable is created
TASK_SOURCE_REFERENCE	VARCHAR2 (25)	No	The task reference of the task where the deliverable is created
ITEM_ID	NUMBER	No	The ID of the item. This ITEM_ID applies only to item deliverables.
INVENTORY_ORG_ID	NUMBER	No	The inventory org ID of the item. INVENTORY_ORG_ID applies only to item deliverables.
QUANTITY	NUMBER	No	The quantity of the item. QUANTITY applies only to item deliverables.
UOM_CODE	VARCHAR2 (30)	No	The unit of measure code of the deliverable. UOM_CODE applies only to item deliverables.
UNIT_PRICE	NUMBER	No	The unit price of the deliverable. UNIT_PRICE applies only to item deliverables.
UNIT_NUMBER	VARCHAR2 (30)	No	The unit number of the deliverable. UNIT_NUMBER is needed when an item deliverable is unit number enabled.
CURRENCY_CODE	VARCHAR2 (15)	No	The currency code of the deliverable. CURRENCY_CODE applies only to item deliverables.

DELIVERABLE_OUT_REC_TYPE

The following table shows the DELIVERABLE_OUT_REC_TYPE datatype.

Name	Type	Required?	Description
DELIVERABLE_ID	NUMBER	Yes	The unique identifier of the deliverable in Oracle Projects
RETURN_STATUS	VARCHAR2 (1)		API standard

ACTION_IN_REC_TYPE

The following table shows the ACTION_IN_REC_TYPE datatype.

Name	Type	Required?	Description
ACTION_NAME	VARCHAR2 (100)	Yes	Name of the deliverable action
ACTION_OWNER_ID	NUMBER	No	ID of the deliverable action owner
ACTION_ID	NUMBER	No	The unique identifier of the deliverable action in Oracle Projects
FUNCTION_CODE	VARCHAR2 (30)	No	The deliverable action function code
DUE_DATE	DATE	No	The due date of the deliverable action
COMPLETION_DATE	DATE	No	The completion date of the deliverable action
DESCRIPTION	VARCHAR2 (2000)	No	Description of the deliverable action
PM_SOURCE_CODE	VARCHAR2 (30)	No	Identifier of the external system
PM_ACTION_REFERENCE	VARCHAR2 (25)	Yes	The unique identifier of the deliverable action in the external system

Name	Type	Required?	Description
PM_DELIVERABLE_REFERENCE	VARCHAR2 (25)	Yes	The unique identifier of the deliverable in the external system
DELIVERABLE_ID	NUMBER	Yes	The unique identifier of the deliverable in Oracle Projects
FINANCIAL_TASK_ID	NUMBER	No	Financial task ID
FINANCIAL_TASK_REFERENCE	VARCHAR2 (25)	No	The unique identifier of the financial task in the external system
DESTINATION_TYPE_CODE	VARCHAR2 (30)	No	The destination type code of the deliverable action
RECEIVING_ORG_ID	NUMBER	No	The inventory org ID of the inventory organization that will receive the item
RECEIVING_LOCATION_ID	NUMBER	No	The location (address) where the item will be received. The RECEIVING_LOCATION_ID must be related to the RECEIVING_ORG_ID.
PO_NEED_BY_DATE	DATE	No	The date by which the purchase order is needed
VENDOR_ID	NUMBER	No	The ID of the vendor that will supply the object
VENDOR_SITE_CODE	VARCHAR2 (15)	No	The location (address) code of the vendor from where the object will be supplied
QUANTITY	NUMBER	No	Quantity for procurement deliverable action
UOM_CODE	VARCHAR2 (30)	No	The unit of measure code for procurement deliverable action
UNIT_PRICE	NUMBER	No	The unit price of the object. The unit price is needed only for non-item deliverable procurement actions.
EXCHANGE_RATE_TYPE	VARCHAR2 (30)	No	Exchange rate type for procurement deliverable actions

Name	Type	Required?	Description
EXCHANGE_RATE_DATE	DATE	No	Exchange rate date for procurement deliverable actions
EXCHANGE_RATE	NUMBER	No	Exchange rate for procurement deliverable actions
EXPENDITURE_TYPE	VARCHAR2 (30)	No	The expenditure type is needed only for non-item deliverable procurement actions.
EXPENDITURE_ORG_ID	NUMBER	No	Expenditure organization for procurement deliverable actions
EXPENDITURE_ITEM_DATE	DATE	No	Expenditure item date for procurement deliverable actions
REQUISITION_LINE_TYPE_ID	NUMBER	No	The requisition line type can only have a type of "AMOUNT". The requisition line type is needed only for non-item deliverable procurement actions.
CATEGORY_ID	NUMBER	No	The item category ID is needed only for non-item deliverable procurement actions.
READY_TO_PROCURE_FLAG	VARCHAR2 (1)	No	Flag that indicates whether an idem is ready to procure
INITIATE_PROCURE_FLAG	VARCHAR2 (1)	No	Flag that indicates whether a procurement action should be initiated
SHIP_FROM_ORGANIZATION_ID	NUMBER	No	The inventory org ID of the inventory organization that will ship the item
SHIP_FROM_LOCATION_ID	NUMBER	No	The location (address) where the item will be shipped. The SHIP_FROM_LOCATION_ID must be related to the SHIP_FROM_ORG_ID.
SHIP_TO_ORGANIZATION_ID	NUMBER	No	The customer account ID to which the item will be shipped

Name	Type	Required?	Description
SHIP_TO_LOCATION_ID	NUMBER	No	The customer location (address) to where the item will be shipped. The SHIP_TO_LOCATION_ID must be related to the SHIP_TO_ORG_ID.
DEMAND_SCHEDULE	VARCHAR2 (10)	No	Demand schedule
EXPECTED_SHIPMENT_DATE	DATE	No	Expected shipment date
PROMISED_SHIPMENT _DATE	DATE	No	Promised shipment date
VOLUME	NUMBER	No	The volume of each object to be shipped. The volume is needed only for non-item shipping.
VOLUME_UOM	VARCHAR2 (10)	No	The volume unit of measure of each object to be shipped. The volume unit of measure is needed only for non-item shipping.
WEIGHT	NUMBER	No	The weight of each object to be shipped. The weight is needed only for non-item shipping.
WEIGHT_UOM	VARCHAR2 (10)	No	The weight unit of measure of each object to be shipped. The weight unit of measure is needed only for non-item shipping.
READY_TO_SHIP_FLAG	VARCHAR2 (1)	No	Flag that indicates whether an item is ready to ship
INITIATE_PLANNING_FLAG	VARCHAR2(1)	No	Flag that indicates whether planning should be initiated
INITIATE_SHIPING_FLAG	VARCHAR2 (1)	No	Flag that indicates whether shipping should be initiated
EVENT_TYPE	VARCHAR2 (30)	No	Billing event type

Name	Type	Required?	Description
CURRENCY	VARCHAR2 (30)	No	Currency code for the billing event
INVOICE_AMOUNT	NUMBER	No	Invoice amount for the billing event
REVENUE_AMOUNT	NUMBER	No	Revenue amount for the billing event
EVENT_DATE	DATE	No	Event date for the billing event
EVENT_NUMBER	NUMBER	No	Event number for the billing event
ORGANIZATION_ID	NUMBER	No	Organization ID of the organization associated with the billing event
BILL_HOLD_FLAG	VARCHAR2 (1)	No	Flag that indicates whether a billing event is on hold
PROJECT_FUNCTIONAL_RATE_TYPE	VARCHAR2 (30)	No	Rate type for project functional currency for the billing event
PROJECT_FUNCTIONAL_RATE_DATE	DATE	No	Rate date for project functional currency for the billing event
PROJECT_FUNCTIONAL_RATE	NUMBER	No	Rate for project functional currency for the billing event
PROJECT_RATE_TYPE	VARCHAR2 (30)	No	Rate type for project currency for the billing event
PROJECT_RATE_DATE	DATE	No	Rate date for project currency for the billing event
PROJECT_RATE	NUMBER	No	Rate for project currency for the billing event
FUNDING_RATE_TYPE	VARCHAR2 (30)	No	Rate type for funding currency for the billing event
FUNDING_RATE_DATE	DATE	No	Rate date for funding currency for the billing event

Name	Type	Required?	Description
FUNDING_RATE	NUMBER	No	Rate for funding currency for the billing event
PM_EVENT_REFERENCE	VARCHAR2 (25)	No	The unique identifier of the billing event in the external system

ACTION_OUT_REC_TYPE

The following table shows the ACTION_OUT_REC_TYPE datatype.

Name	Type	Required?	Description
ACTION_ID	NUMBER	Yes	The unique identifier of the deliverable action in Oracle Projects
RETURN_STATUS	VARCHAR2 (1)		API standard

Using Project Definition APIs

The following example describes how to create an interface between Oracle Projects and the project and task information entered in your system. Depending on your company's business needs, your implementation of the project APIs may be more or less complex than the scenario shown here. As you work through the example, you may want to refer to information elsewhere in the manual:

- For a detailed description of the project APIs, see Project APIs., page 3-2
- Most of the Oracle Projects APIs use a standard set of input and output parameters. For a description of these parameters, see Standard API Parameters, page 2-21.
- For an example of PL/SQL code for creating a project without using composite datatypes, see Creating a Project Using the Load-Execute-Fetch APIs, page 3-60.

Step 1: Connect to an Oracle Database

To ensure that proper security is enforced while accessing Oracle Projects data, follow the steps in Security Requirements, page 2-8.

Step 2: Select a Source Template or Project

When using the APIs to create a new project in Oracle Projects, first select a project template from which to create the new project. Oracle Projects will not create a new project unless you perform this step. Use the API view PA_SELECT_TEMPLATE_V to select a valid Oracle Projects source template.

Alternatively, you can choose a source project. The only difference between templates and projects is that the field TEMPLATE_FLAG for templates is set to Y. All projects originate from templates, and the originating template determines which Quick Entry fields appear in your new project. In this section, all instructions involving source templates also apply to source projects.

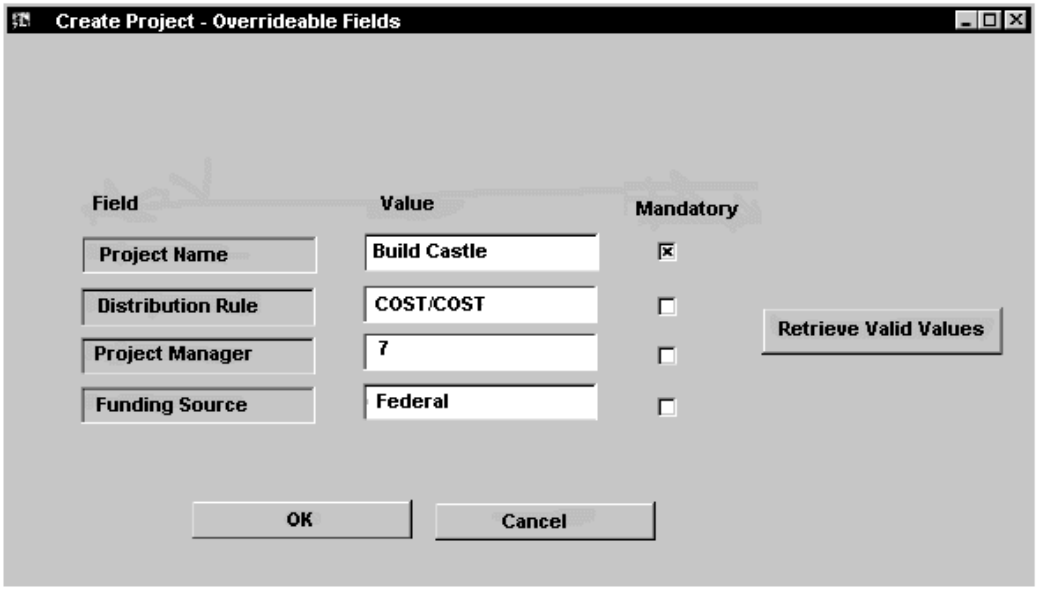
Step 3: Get the Quick Entry Fields of the Source Template

After you select a source template, use the PA_SOURCE_TEMPLATE_ID to retrieve the Quick Entry fields associated with the template. You assign Quick Entry fields to a template when you create the template in Oracle Projects. For more information about Quick Entry fields, see PA_PROJECT_COPY_OVERRIDES in Oracle eTRM, available on Oracle *Metalink*.

The view PA_OVERRIDE_FIELDS_V displays all the Quick Entry fields associated with a particular template. The user interface you design should display at least the Display Name, Value, and Mandatory fields and should allow users to enter information only into the Value field.

An example of a user interface that meets these requirements is shown below:

Example of a Quick Entry (Overridable Fields) Window



Step 4: Enter Valid Data for the Quick Entry Fields

Lists of values (LOVs) validate most of the Quick Entry fields. The view PA_OVERRIDE_FIELDS_V retrieves the name of the view that contains the valid data for the active row and returns this name in the field LOV_VIEW_NAME. Your project management tool can use this information to dynamically access the appropriate view.

For example, if you place your cursor in the Funding Source field and choose Retrieve Valid Values, your project management tool will display a screen with two columns, Code and Description. Values retrieved from the database view PA_CLASS_CATEGORIES_LOV_V will appear under these two column headings.

You can also use the following views to retrieve lists of values for a project's Quick Entry fields:

- PA_PROJECT_STATUS_CODES_LOV_V
- PA_DISTRIBUTION_RULES_LOV_V
- PA_KEY_MEMBERS_LOV_V
- PA_ORGANIZATIONS_LOV_V
- PA_CUSTOMERS_LOV_V

Step 5: Interface Project Information to the Server

Not all tools can call the APIs that use composite datatypes. Tools that do not support composite datatypes must call the supplementary Load-Execute-Fetch APIs. The Load-Execute-Fetch APIs include procedures to initialize, load, execute, fetch, and clear data.

Use these APIs only if you use a tool that does not support composite datatype parameters. If the tool (for example, Oracle PL/SQL Version 2.3 or higher) supports composite datatype parameters, you can call the CREATE_PROJECT and UPDATE_PROJECT APIs directly.

The following table illustrates the relationship between the information in the user interface and LOAD_PROJECT:

Quick Entry Field Value	LOAD_PROJECT PARAMETER
NAME	P_PROJECT_NAME
DESCRIPTION	P_DESCRIPTION
START_DATE	P_START_DATE
COMPLETION_DATE	P_COMPLETION_DATE
PROJECT_STATUS_CODE	P_PROJECT_STATUS_CODE
PUBLIC_SECTOR_FLAG	P_PUBLIC_SECTOR_FLAG
DISTRIBUTION_RULE	P_DISTRIBUTION_RULE
CARRYING_OUT_ORGANIZATION_ID	P_CARRYING_OUT_ORGANIZATION_ID
CUSTOMER_NAME	P_CUSTOMER_ID

LOAD_PROJECT passes the values entered into the Quick Entry value field to their corresponding parameters. LOAD_PROJECT passes additional parameters, depending on whether you are updating an existing project or creating a new one. When youcreate a new project, this procedure must also pass the following parameters:

- P_PM_PROJECT_REFERENCE passes the unique reference code that identifies the project in the external system.
- P_CREATED_FROM_PROJECT_ID passes the unique reference code that identifies the source template in Oracle Projects (PA_SOURCE_TEMPLATE_ID).

If your project has multiple key members or class categories, you must call the APIs LOAD_KEY_MEMBER and LOAD_CLASS_CATEGORY for every key member and class category associated with your project.

During project creation, the Quick Entry fields Key Members and Class Category are related to the input parameters shown in the two tables that follow.

The following table shows the input parameters for the key member quick entry field.

Key Member Quick Entry Field	Input Parameter for LOAD_KEY_MEMBERS
KEY_MEMBER (value)	P_PERSON_ID
KEY_MEMBER (display_name)	P_PROJECT_ROLE_TYPE

The following table shows the input parameters for the class category quick entry field.

Class Category Quick Entry Field	Input Parameter for LOAD_CLASS_CATEGORY
CLASS_CATEGORY (value)	P_CLASS_CODE
CLASS_CATEGORY (display_name)	P_CLASS_CATEGORY

Step 6: Interface Task Information to the Server

After you interface the project-related data to the server, you can call LOAD_TASK to interface task-related data to the server-side global PL/SQL tables. Call LOAD_TASK once for every task in the project.

> **Important:** Youmust load parent tasks before you can load their subtasks.

Each task must specify at least the following information:

- P_PM_TASK_REFERENCE**.** The unique reference code that identifies the task in the external system.
- P_PM_PARENT_TASK_REFERENCE**.** The unique reference code that identifies the task's parent task. This parameter is left blank for top tasks.
- P_TASK_NAME**.** The name of the task.

For the names and descriptions of other parameters that LOAD_TASK can pass, see

LOAD_TASK, page 3-81.

Step 7: Start the Server-Side Process

After the Load procedures have successfully moved project and task data to the Oracle Projects global PL/SQL tables, call the procedure EXECUTE_CREATE_PROJECT to process the project and task data that you interfaced to the global PL/SQL tables. In addition to the standard input and output parameters, this Execute procedure requires the following parameters:

- Input parameter: P_PM_PRODUCT_CODE, the identification code of the product exporting the project. For information about setting up your product (external system) as a source, refer to Setting Up Your Product in Oracle Projects, page 2-7.

- Output parameters:
  - P_PA_PROJECT_ID, the unique Oracle Projects identification code for the new project.

  - P_PA_PROJECT_NUMBER, the unique Oracle Projects number for the new project. If you have set up Oracle Projects to support manual project numbering, P_PA_PROJECT_NUMBER should be identical to the P_PM_PROJECT_REFERENCE. If you have implemented automatic numbering, this parameter returns an automatically generated number.

Step 8: Get Return Values for Tasks

After the Load and Execute procedures create your project and tasks in Oracle Projects, use FETCH_TASK to return each unique task identification code from Oracle Projects. The key parameters for this procedure are the input parameter P_TASK_INDEX, which points to a single task, and the output parameters P_PA_TASK_ID and P_PM_TASK_REFERENCE.

To call the procedure for each task, you can write a simple program to call FETCH_TASK in a loop with P_TASK_INDEX as the stepping variable (1 through the total number of tasks). The output parameter P_TASK_RETURN_STATUS indicates whether the API handled the specific task successfully ('S'). If the parameter returns an 'E' or 'U', the task caused an error, and you must stop the Fetch procedure to retrieve the related error message. Fetch APIs do not return error message data. Instead, use GET_MESSAGES to retrieve the error text, as described in the next step.

Step 9: Retrieve Error Messages

Every Oracle Projects API includes two standard output parameters: P_RETURN_STATUS indicates whether the API was executed successfully, and P_MSG_COUNT shows the number of errors detected during the execution of the API.

If the API detects one error, the API returns the error message text. If the API detects

multiple errors, use GET_MESSAGES to retrieve the error messages. See GET_MESSAGES, page 2-25.

Step 10: Finish the Load-Execute-Fetch Process

After executing the Fetch procedures and retrieving any error messages, finish the Load-Execute-Fetch process by calling the API CLEAR_PROJECT and either save or rollback your changes to the database.

Creating a Project Using the Load-Execute-Fetch APIs

The following PL/SQL code is a sample of a script that you can use to create a project using the Load-Execute-Fetch APIs.

The Load-Execute-Fetch APIs use parameters with standard datatypes (VARCHAR2, NUMBER, and DATE). They do not use composite datatypes.

```
DECLARE
--variables needed to create task hierarchy
level1 NUMBER;
level2 NUMBER;
level3 NUMBER;
a NUMBER := 0;
m NUMBER := 0;
parent_level1 VARCHAR2(30);
parent_level2 VARCHAR2(30);
parent_level3 VARCHAR2(30);
number_of_tasks1 NUMBER; --number of tasks/level
number_of_tasks2 NUMBER;
number_of_tasks3 NUMBER;
number_of_tasks4 NUMBER;

--variables needed for API standard parameters
l_api_version_number NUMBER :=1.0 ;
l_commit VARCHAR2(1):= 'F';
l_return_status VARCHAR2(1);
l_init_msg_list VARCHAR2(1);
l_msg_count NUMBER;
l_msg_data VARCHAR2(2000);
l_data VARCHAR2(2000);
l_msg_entity VARCHAR2(100);
l_msg_entity_index NUMBER;
l_msg_index NUMBER;
l_msg_index_out NUMBER;
l_encoded VARCHAR2(1);
```

```
--variables needed for Oracle Project specific parameters
l_created_from_project_id NUMBER;
l_pm_product_code VARCHAR2(10);
l_number_of_task_levels NUMBER;
l_project_name VARCHAR2(30);
l_pm_project_reference VARCHAR2(25);
l_project_status_code VARCHAR2(30);
l_distribution_rule VARCHAR2(30);
l_public_sector_flag VARCHAR2(1);
l_carrying_out_organization_id NUMBER;
l_start_date DATE;
l_completion_date DATE;
l_actual_start_date DATE;
l_actual_finish_date DATE;
l_early_start_date DATE;
l_early_finish_date DATE;
l_late_start_date DATE;
l_late_finish_date DATE;
l_person_id NUMBER;
l_project_role_type VARCHAR2(20);
l_class_category VARCHAR2(30);
l_class_code VARCHAR2(30);
l_project_id NUMBER(15);
l_pa_project_number VARCHAR2(25);
l_project_description VARCHAR2(250);
l_customer_id NUMBER;
l_project_relationship_code VARCHAR2(30);
l_task_id NUMBER(15);
l_pm_task_reference VARCHAR2(25);
l_task_index NUMBER;
l_tasks_in pa_project_pub.task_in_tbl_type;
l_task_rec pa_project_pub.task_in_rec_type;
l_key_member_rec pa_project_pub.project_role_rec_type;
l_key_member_tbl pa_project_pub.project_role_tbl_type;
l_task_return_status VARCHAR2(1);
API_ERROR EXCEPTION;

BEGIN

--PRODUCT RELATED DATA
l_pm_product_code :='SOMETHING';

--PROJECT DATA
l_created_from_project_id := 1040;
l_project_name := 'PROJECT_NAME';
l_pm_project_reference := 'PROJECT_NAME';
l_project_description := 'PROJECT_DESCRIPTION';
l_project_status_code := '';
--l_distribution_rule := 'COST/COST';
l_carrying_out_organization_id :=2;
l_start_date :='01-jan-94';
l_completion_date :='31-mar-99';
l_actual_start_date :='01-jan-93';
l_actual_finish_date :='01-apr-99';
l_early_start_date :='01-jan-94';
l_early_finish_date :='31-mar-99';
l_late_start_date :='01-jan-94';
l_late_finish_date :='31-mar-99';
```

```
--KEY MEMBERS DATA
m:= 1;
l_person_id :='29';
l_project_role_type :='PROJECT MANAGER';
l_key_member_rec.person_id :=29;
l_key_member_rec.project_role_type :='PROJECT MANAGER';
l_key_member_tbl(m) := l_key_member_rec;
m:=2;
l_key_member_rec.person_id :=30;
l_key_member_rec.project_role_type :='Project Coordinator';
l_key_member_tbl(m) := l_key_member_rec;
m:=3;
l_key_member_rec.person_id :=7;
l_key_member_rec.project_role_type :='Project Coordinator';
l_key_member_tbl(m) := l_key_member_rec;

--CLASS CATEGORIES DATA
l_class_category :='Funding Source';
l_class_code :='Federal';

--TASKS DATA
--Set the number of tasks for every level (there are 4 levels)
number_of_tasks1 := 10;
number_of_tasks2 := 1;
number_of_tasks3 := 1;
number_of_tasks4 := 0;
```

```
for level1 in 1..number_of_tasks1 loop
a:= a + 1;
l_task_rec.pm_task_reference :=a;
l_task_rec.task_name :='TOP LEVEL '||a;
l_task_rec.pm_parent_task_reference :='';
l_task_rec.task_start_date := '09-MAR-95';
l_task_rec.task_completion_date := '05-JUL-95';
l_task_rec.actual_start_date := '10-MAR-95';
l_task_rec.actual_finish_date := '06-JUL-95';
l_task_rec.early_start_date := '09-MAR-95';
l_task_rec.early_finish_date := '05-JUL-95';
l_task_rec.late_start_date := '09-MAR-95';
l_task_rec.late_finish_date := '05-JUL-95';
--l_task_rec.address_id := 1012;
l_tasks_in(a):= l_task_rec;
parent_level1:= a;
FOR level2 IN 1..number_of_tasks2 LOOP
a:= a + 1;
l_task_rec.pm_task_reference :=a;
l_task_rec.task_name :='2 LEVEL '||a;
l_task_rec.pm_parent_task_reference := parent_level1;
l_tasks_in(a) := l_task_rec;
parent_level2 := a;
for level3 IN 1..number_of_tasks3 loop
a := a + 1;
l_task_rec.pm_task_reference := a;
l_task_rec.task_name :='3 LEVEL '||a;
l_task_rec.pm_parent_task_reference :=
parent_level2;
l_tasks_in(a) := l_task_rec;
parent_level3 := a;
for level4 IN 1..number_of_tasks4 loop
a := a + 1;
l_task_rec.pm_task_reference := a;
l_task_rec.task_name :='Fourth LEVEL
'||a;
l_task_rec.pm_parent_task_reference :=
parent_level3;
l_tasks_in(a) := l_task_rec;
end loop;
end loop;
END LOOP;
end loop;
-----------------------
```

```
--INIT_CREATE_PROJECT
pa_project_pub.init_project;
-----------------------
--LOAD_PROJECT
pa_project_pub.load_project( p_api_version_number =>
l_api_version_number
,p_return_status => l_return_status
,p_created_from_project_id =>
l_created_from_project_id
,p_project_name => l_project_name
,p_description =>
l_project_description
,p_pm_project_reference =>
l_pm_project_reference
,p_pa_project_number =>
'rk-test-number'
,p_carrying_out_organization_id =>
l_carrying_out_organization_id
,p_public_sector_flag =>
l_public_sector_flag
,p_customer_id => l_customer_id
,p_project_status_code =>
l_project_status_code
,p_start_date => l_start_date
,p_completion_date =>
l_completion_date
,p_actual_start_date =>
l_actual_start_date
,p_actual_finish_date =>
l_actual_finish_date
,p_early_start_date =>
l_early_start_date
,p_early_finish_date =>
l_early_finish_date
,p_late_start_date =>
l_late_start_date
,p_late_finish_date =>
l_late_finish_date
,p_distribution_rule =>
l_distribution_rule);
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
-----------------------
--LOAD_KEY_MEMBER (loop for multiple key members)
FOR i in 1..1 LOOP
pa_project_pub.load_key_member( p_api_version_number =>
l_api_version_number
,p_return_status => l_return_status
,p_person_id =>
l_key_member_tbl(i).person_id
,p_project_role_type =>
l_key_member_tbl(i).project_role_type );
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
END LOOP;
-----------------------
--LOAD_CLASS_CATEGORY (loop for mulitple class categories
```

```
--This example has
-- only one )
FOR i IN 1..1 LOOP
pa_project_pub.load_class_category(
p_api_version_number =>
l_api_version_number
,p_return_status => l_return_status
,p_class_category => l_class_category
,p_class_code => l_class_code );
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
END LOOP;
-----------------------
--LOAD_TASK (loop for multiple tasks)
FOR i IN 1..a LOOP
pa_project_pub.load_task( p_api_version_number =>
l_api_version_number
,p_return_status => l_return_status
,p_pm_task_reference =>
l_tasks_in(i).pm_task_reference
,p_task_name => l_tasks_in(i).task_name
,p_pm_parent_task_reference =>
l_tasks_in(i).pm_parent_task_reference
,p_task_start_date =>
l_tasks_in(i).task_start_date
,p_task_completion_date =>
l_tasks_in(i).task_completion_date
,p_actual_start_date =>
l_tasks_in(i).actual_start_date
,p_actual_finish_date =>
l_tasks_in(i).actual_finish_date
,p_early_start_date =>
l_tasks_in(i).early_start_date
,p_early_finish_date =>
l_tasks_in(i).early_finish_date
,p_late_start_date =>
l_tasks_in(i).late_start_date
,p_late_finish_date =>
l_tasks_in(i).late_finish_date
,p_address_id =>
l_tasks_in(i).address_id);
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
END LOOP;
-----------------------
--EXECUTE_CREATE_PROJECT
pa_project_pub.execute_create_project(p_api_version_number =>
l_api_version_number
,p_commit => l_commit
,p_init_msg_list => 'F'
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_return_status => l_return_status
,p_pm_product_code =>
l_pm_product_code
,p_pa_project_id => l_project_id
,p_pa_project_number =>
```

```
l_pa_project_number);
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
-----------------------
--FETCH_TASK
FOR l_task_index in 1..a LOOP
pa_project_pub.fetch_task( p_api_version_number =>
l_api_version_number
,p_return_status => l_return_status
,p_task_index => l_task_index
,p_pa_task_id => l_task_id
,p_pm_task_reference =>
l_pm_task_reference
,p_task_return_status =>
l_task_return_status);
IF l_return_status != 'S'
OR l_task_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
END LOOP;
-----------------------
--CLEAR_CREATE_PROJECT
pa_project_pub.clear_project;
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
-----------------------
--HANDLE EXCEPTIONS
EXCEPTION
WHEN API_ERROR THEN
for i in 1..l_msg_count loop
pa_interface_utils_pub.get_messages (
p_msg_data => l_msg_data
,p_data => l_data
,p_msg_count => l_msg_count
,p_msg_index_out => l_msg_index_out );
dbms_output.put_line ('error mesg '||l_data);
end loop;
WHEN OTHERS THEN
for i in 1..l_msg_count loop
pa_interface_utils_pub.get_messages (
p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_data => l_data
,p_msg_index_out => l_msg_index_out);
dbms_output.put_line ('error mesg '||l_data);
end loop;
END ;
/
```

Structure APIs

The structure APIs enable you to use an external system to create and change structure versions. The structure APIs also enable you to add, update, and delete tasks.

Note: When youcall any structure API that requires a task identifier, you must identify the task by passing either the P_PA_TASK_ID or the P_PM_TASK_REFERENCE parameter.

Structure API Views

The following table lists the views that provide parameter data for the structure APIs. For detailed descriptions of the views, refer to Oracle eTRM, which is available on Oracle*MetaLink*.

View	Description
PA_PROJECT_STATUS_LOV_V	Retrieves project statuses from Oracle Projects
PA_SERVICE_TYPE_LOV_V	Because valid service type codes must be selected for the parameter service_type_code, you can use this view to Retrieves valid codes for service_type_code from Oracle Projects and display them in your external system.
PA_TASK_MANAGERS_LOV_V	Because valid employees must be selected for the parameter TASK_MANAGER_PERSON_ID, you can use this view to retrieve valid employees from Oracle Projects and display them in your external system.
PA_TASKS_AMG_V	Retrieves information about all valid tasks for the organization associated with the user's responsibility. This view provides a list of financial tasks and their related attributes.
PA_TASKS_LOWEST_V	A supplementary view used to simplify coding in forms.
PA_TASK_PROGRESS_AMG_V	Retrieves information about all valid task progress for the organization associated with the user's responsibility.
PA_STRUCT_TASKS_AMG_V	You can use this view to retrieve valid structures from Oracle Projects and display them in your external system. This list provides a list of tasks and their related attributes.

View	Description
PA_STRUCT_VERSIONS_LOV_AMG_V	You can use this view to retrieve valid structure versions from Oracle Projects and display them in your external system. This view provides a list of structure versions.
PA_TASK_INV_METHODS_LOV_V	This view retrieves the invoice methods for the tasks.
PA_TOP_TASK_CUSTOMERS_LOV_V	This view retrieves all of the customers for a project.

Structure API Procedures

The procedures discussed in this section are listed below. The procedures are located in the public API package PA_PROJECT_PUB.

- Structure and Task Procedures
  - ADD_TASK, page 3-69
  - APPLY_LP_PROG_ON_CWV, page 3-72
  - BASELINE_STRUCTURE, page 3-72
  - CHANGE_CURRENT_WORKING_VERSION, page 3-73
  - CHANGE_STRUCTURE_STATUS, page 3-73
  - DELETE_STRUCTURE_VERSION, page 3-74
  - DELETE_TASK, page 3-74
  - GET_TASK_VERSION, page 3-75
  - GET_DELETED_TASKS_FROM_OP, page 3-76
  - UPDATE_TASK, page 3-76
- Load-Execute-Fetch Procedures
  - FETCH_STRUCTURE_VERSION, page 3-80
  - FETCH_TASK, page 3-80

Structure APIs Procedure Definitions

This section contains description of the structure APIs, including business rules and parameters.

ADD_TASK

ADD_TASK is a PL/SQL procedure used to add new subtasks to a task of a project in Oracle Projects. The task record type has been replaced with a parameter with a standard datatype (NUMBER, VARCHAR2, or DATE) for every field in the record type definition so that you can call this procedure directly.

Business Rules (task level)

Oracle Projects imposes the following task-level business rules:

- Each new task must have a unique number within a given project. You can use the Check procedure CHECK_UNIQUE_TASK_NUMBER to verify that the new task number does not already exist in your project.

- You cannot create a subtask for any project if the parent task has any of the

following attributes:

- Transaction controls
- Burden schedule overrides
- A budget
- A percentage complete value
- An asset
- An expenditure item
- A purchase order distribution
- A purchase order requisition
- An Oracle Payables invoice
- An Oracle Payables invoice distribution

  Note: You can use the Check procedure CHECK_ADD_SUBTASK_OK to verify that you can add a subtask to a particular parent task.

- For contract projects, you cannot add a subtask to a parent task that has any of the following attributes:
  - Labor cost multiplier
  - Job bill rate override
  - Employee bill rate override
  - Labor multiplier
  - Non-labor bill rate override
  - Job bill title override
  - Job assignment override

    Note: You can use the Check procedure CHECK_ADD_SUBTASK_OK to verify that you can add a subtask to a particular parent task.

Performing Scheduling Validations

When set to 'N' the P_OP_VALIDATE_FLAG parameter eliminates redundant validation for certain types of scheduling data. Unnecessary scheduling validations can slow system performance.

You should set P_OP_VALIDATE_FLAG to 'N' if you are using this API to integrate a third-party scheduling tool with Oracle Projects. Only set this parameter to 'N' if the third-party scheduling tool can perform validations for:

- Dependencies between tasks and activities
- Project schedule dates and task schedule dates

You should set P_OP_VALIDATE_FLAG to 'Y' if you are using the APIs to upload data from a legacy system that does not perform an extensive validation for the above. Scheduling data must be validated in order to ensure data integrity in Oracle Projects.

Parameters for ADD_TASK

You can view descriptions of all of the parameters for ADD_TASK in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for ADD_TASK are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PM_PROJECT_REFERENCE
- P_STRUCTURE_VERSION_ID
- P_PA_PROJECT_ID
- P_PM_TASK_REFERENCE
- P_PA_TASK_NUMBER
- P_TASK_NAME
- P_PRED_STRING
- P_PRED_DELIMITER
- P_BASE_PERCENT_COMP_DERIV_CODE
- P_SCH_TOOL_TSK_TYPE_CODE

- P_CONSTRAINT_TYPE_CODE
- P_CONSTRAINT_DATE
- P_FREE_SLACK
- P_TOTAL_SLACK
- P_EFFORT_DRIVEN_FLAG
- P_LEVEL_ASSIGNMENTS_FLAG
- P_INVOICE_METHOD
- P_CUSTOMER_ID
- P_GEN_ETC_SOURCE_CODE
- P_MAPPED_TASK_ID
- P_MAPPED_TASK_REFERENCE
- P_EXT_ACT_DURATION
- P_EXT_REMAIN_DURATION
- P_EXT_SCH_DURATION

APPLY_LP_PROG_ON_CWV

APPLY_LP_PROG_ON_CWV is used to apply the latest progress information on the current working version of a structure.

You can view descriptions of all of the parameters for APPLY_LP_PROG_ON_CWV in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for APPLY_LP_PROG_ON_CWV are listed below:

- P_API_VERSION_NUMBER
- P_PM_WORKING_STR_VERSION_ID

BASELINE_STRUCTURE

BASELINE_STRUCTURE is a PL/SQL procedure to baseline a structure version

You can view descriptions of all of the parameters for BASELINE_STRUCTURE in the Oracle Integration Repository. The Oracle Integration Repository is described in the

preface of this manual.

The required parameters for BASELINE_STRUCTURE are listed below:

- P_API_VERSION_NUMBER
- P_STRUCTURE_VERSION_ID
- P_PA_PROJECT_ID

CHANGE_CURRENT_WORKING_VERSION

CHANGE_CURRENT_WORKING_VERSION is used to change the current working version of a structure.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_STRUCTURE_VERSION_ID
- P_PA_PROJECT_ID

CHANGE_STRUCTURE_STATUS

Use this PL/SQL procedure to publish, submit, rework, reject, or approve a structure and thereby change its status code. Valid status codes are:

- STRUCTURE_WORKING
- STRUCTURE_PUBLISHED
- STRUCTURE_SUBMITTED
- STRUCTURE_REJECTED
- STRUCTURE_APPROVED

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

- P_STRUCTURE_VERSION_ID
- P_PA_PROJECT_ID
- P_STATUS_CODE

DELETE_STRUCTURE_VERSION

DELETE_STRUCTURE_VERSION is a PL/SQL procedure used to delete a structure version from Oracle Projects.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_STRUCTURE_VERSION_ID

DELETE_TASK

DELETE_TASK is a PL/SQL procedure used to delete tasks of a project in Oracle Projects.

Business Rules (task level)

Oracle Projects imposes the following business rules.

Cascaded Task Deletion

The following rules apply to cascaded task deletion. In cascaded task deletion, when a task is deleted, all of its subtasks are also deleted.

You can delete a top task only if the task satisfies Rules 1 through 8:

You can delete a mid or lowest task if the task satisfies Rules 4 through 8 (for a mid task, the rules relate to the lowest tasks below that mid task):

1. No top task event, such as revenue or billing, exists
2. No top task funding exists
3. No top task budget exists
4. No lowest task expenditure item exists
5. No lowest task purchase order line exists

6. No lowest task requisition line exists
7. No lowest task supplier invoice exists
8. No lowest task budget exists

Non-Cascaded Task Deletion

The following business rules apply to non-cascaded task deletion. In non-cascaded task deletion, deleting a task deletes only that task, and moves all subtasks below it up one level in the project's work breakdown structure.

- You can delete a mid task at all times.
- You can delete a top task if it satisfies Rules 1 through 3 for cascaded task deletion.
- You can delete a lowest task if it satisfies Rules 4 through 8 for cascaded task deletion.

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

GET_TASK_VERSION

GET_TASK_VERSION is used to get the task version ID of a task for a particular structure version.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PA_PROJECT_ID
- P_PA_TASK_ID
- P_PA_STRUCTURE_VERSION_ID

GET_DELETED_TASKS_FROM_OP

When you publish a version-enabled workplan in Oracle Projects, tasks in the working version with a status of To Be Deleted are either deleted or set to a Cancelled status. The GET_DELETED_TASKS_FROM_OP procedure retrieves the list of deleted tasks in Oracle Projects and displays the tasks in an integrated external system such as Microsoft Project.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

All of the parameters for this procedure are OUT parameters; therefore, there are no required parameters.

UPDATE_TASK

UPDATE_TASK is a PL/SQL procedure used to update existing tasks of a project in Oracle Projects. We replaced the task record type with a parameter that uses a standard datatype (VARCHAR2, NUMBER, and DATE) for every field in the record type definition so you can call this procedure directly.

Business Rules (task level)

Oracle Projects imposes the following business rules.

This rule applies to the order in which task information is shared between your external system and Oracle Projects:

- You must interface the definitions of parent tasks to Oracle Projects before you can interface the definitions of the related child tasks.

The following rules apply to task numbers, identification codes, and organizations:

- A new task number must be unique within a project. (You can use the Check procedure CHECK_UNIQUE_TASK_NUMBER to verify whether your new task number is unique in Oracle Projects.)

- If the external system pushes both the TASK_ID and the PM_TASK_REFERENCE to Oracle Projects, Oracle Projects uses the TASK_ID to identify the task and updates PM_TASK_REFERENCE with the incoming value (if different).

- You cannot change a task number if any of the following items have been charged against the task:

    - Expenditure items

    - Purchase order distributions

- Purchase order requisition distributions
- Supplier invoices
- Supplier invoice distributions

Note: You can use the Check procedure CHECK_TASK_NUMBER_CHANGE_OK to verify whether Oracle Projects will allow you to change the number of a certain task.

- You cannot change a task organization if any of the following items have been charged against the task:
  - Cost distribution lines
  - Revenue distribution lines
  - Draft invoices

  The following rules apply to task start and completion dates:
- A task start date must occur:
  - After the parent task start date
  - Before the start date of any subtasks
  - Between the project start and completion dates
- Each task with a completion date must also have a start date.
- A task completion date must occur before the project completion date.

The following rules apply to moving a task within a project's work breakdown structure (WBS).

- You can move a subtask as long as its new parent task belongs to the same top task, because billing, budgeting, and creating capital assets are driven from top tasks.
- You cannot change a top task to a subtask.
- You cannot change a subtask to a top task.

The following rules apply to changing task fields and attributes:

- You cannot update task fields with a NULL value. Only a field with a valid NOT NULL value will be updated.

- You cannot change any of the following task fields to NULL:
  - TASK_NAME
  - PM_TASK_REFERENCE
  - TASK_NUMBER
  - READY_TO_BILL_FLAG
  - READY_TO_DISTRIBUTE_FLAG
  - CARRYING_OUT_ORGANIZATION_ID
  - SERVICE_TYPE_CODE
- You can change the following task attributes without restriction:
  - Task manager
  - Description
  - Other flags not mentioned previously
  - Labor and non-labor data
  - Schedules and rates

Performing Scheduling Validations

When set to 'N' the P_OP_VALIDATE_FLAG parameter eliminates redundant validation for certain types of scheduling data. Unnecessary scheduling validations can slow system performance.

You should set P_OP_VALIDATE_FLAG to 'N' if you are using this API to integrate a third-party scheduling tool with Oracle Projects. Only set this parameter to 'N' if the third-party scheduling tool can perform validations for:

- Dependencies between tasks and activities
- Project schedule dates and task schedule dates

You should set P_OP_VALIDATE_FLAG to 'Y' if you are using the APIs to upload data from a legacy system that does not perform an extensive validation for the above. Scheduling data must be validated in order to ensure data integrity in Oracle Projects.

Parameters for UPDATE_TASK

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of

this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PM_PROJECT_REFERENCE
- P_PA_PROJECT_ID
- P_PM_TASK_REFERENCE
- P_PA_TASK_ID
- P_TASK_NAME
- P_PA_TASK_NUMBER
- P_TASK_DESCRIPTION
- P_PRED_STRING
- P_PRED_DELIMITER
- P_BASE_PERCENT_COMP_DERIV_CODE
- P_SCH_TOOL_TSK_TYPE_CODE
- P_CONSTRAINT_TYPE_CODE
- P_CONSTRAINT_DATE
- P_FREE_SLACK
- P_TOTAL_SLACK
- P_EFFORT_DRIVEN_FLAG
- P_LEVEL_ASSIGNMENTS_FLAG
- P_INVOICE_METHOD
- P_CUSTOMER_ID
- P_GEN_ETC_SOURCE_CODE
- P_FINANCIAL_TASK_FLAG

- P_MAPPED_TASK_ID
- P_MAPPED_TASK_REFERENCE
- P_DELIVERABLE
- P_EXT_ACT_DURATION
- P_EXT_REMAIN_DURATION
- P_EXT_SCH_DURATION
- P_ETC_EFFORT
- P_PERCENT_COMPLETE

FETCH_STRUCTURE_VERSION

FETCH_STRUCTURE_VERSION is a Load-Execute-Fetch procedure that returns structure version IDs of workplan and financial structures.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

FETCH_TASK

FETCH_TASK is a Load-Execute-Fetch procedure used to fetch output parameters related to tasks. FETCH_TASK is used to load successfully processed tasks to a global PL/SQL table.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_TASK_INDEX

FETCH_TASKS

FETCH_TASKS is a wrapper for FETCH_TASK to handle multiple calls to FETCH_TASK.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_TASK_INDEX

FETCH_TASK_VERSION

FETCH_TASK_VERSION is a Load-Execute-Fetch procedure that returns version identifiers of tasks.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_TASK_INDEX

LOAD_STRUCTURE

LOAD_STRUCTURE is a Load-Execute-Fetch procedure used to load structure data.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

LOAD_TASK

LOAD_TASK is a Load-Execute-Fetch procedure used to load a task to a global PL/SQL table.

Business Rule (task level)

Oracle Projects imposes the following business rule:

- Parent tasksmustbe loaded before their subtasks.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of

this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_TASK_NAME
- P_PA_TASK_NUMBER
- P_PRED_STRING
- P_PRED_DELIMITER
- P_BASE_PERCENT_COMP_DERIV_CODE
- P_SCH_TOOL_TSK_TYPE_CODE
- P_CONSTRAINT_TYPE_CODE
- P_CONSTRAINT_DATE
- P_FREE_SLACK
- P_TOTAL_SLACK
- P_EFFORT_DRIVEN_FLAG
- P_LEVEL_ASSIGNMENTS_FLAG
- P_INVOICE_METHOD
- P_CUSTOMER_ID
- P_GEN_ETC_SOURCE_CODE
- P_FINANCIAL_TASK_FLAG
- P_MAPPED_TASK_ID
- P_MAPPED_TASK_REFERENCE
- P_EXT_ACT_DURATION
- P_EXT_REMAIN_DURATION
- P_EXT_SCH_DURATION
- P_ETC_EFFORT

- P_PERCENT_COMPLETE

LOAD_TASKS

LOAD_TASKS is a Load-Execute-Fetch procedure used to load tasks to a global PL/SQL table. The parameters for this procedure are the same as those for LOAD_TASK, page 3-81.

Check Procedures

The following check procedures are PL/SQL procedures used to verify in real time that:

- Task information you have entered into your external system is unique in Oracle Projects
- Certain functions, such as deleting a task, follow the business rules defined in Oracle Projects

CHECK_ADD_SUBTASK_OK

Use the Check procedure CHECK_ADD_SUBTASK_OK to determine if a subtask can be added to a parent task.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

CHECK_CHANGE_PARENT_OK

Use the Check procedure CHECK_CHANGE_PARENT_OK to determine if you can move a task from one parent task to another. You can move a task as long as it retains the same top task.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

CHECK_DELETE_TASK_OK

Use the Check procedure CHECK_DELETE_TASK_OK to determine if you can delete a

task.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

CHECK_TASK_NUMBER_CHANGE_OK

Use the Check procedure CHECK_TASK_NUMBER_CHANGE_OK to determine if you can change a task's number.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

CHECK_TASK_MFD

Use the check procedure CHECK_TASK_MFD to determine whether tasks deleted in an external scheduling system such as Microsoft Project can be deleted in Oracle Projects when that system is integrated with Oracle Projects. Tasks are deleted immediately in Oracle Projects if no published version exists, and are marked for deletion or cancelled when the working workplan version is published in Oracle Projects. This procedure prevents tasks from being deleted if they have transactions.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

CHECK_UNIQUE_TASK_NUMBER

Use the Check procedure CHECK_UNIQUE_TASK_NUMBER to determine if a new or changed task number is unique within a project.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

CHECK_UNIQUE_TASK_REFERENCE

Use the Check procedure CHECK_UNIQUE_TASK_REFERENCE to determine if a new or changed task reference (PM_TASK_REFERENCE) is unique.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

User-Defined Attribute APIs

You can use the user-defined attributes APIs to integrate user-defined attributes from an external system with Oracle Projects.

User-defined attributes enable you to capture unlimited information about projects and tasks to support the needs of your business. User-defined attributes are defined by the implementation team. They provide advanced project and task attribution with no coding, and feature a configurable user interface with complex validation. For more information about user-defined attributes, see User-Defined Attributes for Projects, *Oracle Projects Fundamentals* and Setting Up User-Defined Attributes, *Oracle Projects Implementation Guide*.

User-Defined Attribute Procedures

The procedures discussed in this section are listed below. The procedures are located in the public API package PA_PROJECT_PUB.

- LOAD_EXTENSIBLE_ATTRIBUTE
- LOAD_EXTENSIBLE_ATTRIBUTES

These procedures are called by the following load-execute-fetch procedures:

- Execute_Create_Project, page 3-17
- Execute_Update_Project, page 3-18

Global Constants

The package PA_PROJECT_PUB includes global constants, which are used for the parameter P_TRANSACTION_TYPE. The global constants are listed in the following table:

Constant	Description
G_CREATE_MODE	Creates the extensible attribute row
G_UPDATE_MODE	Updates an existing extensible attribute row
G_DELETE_MODE	Deletes the extensible attribute row
G_SYNC_MODE	Creates/updates/deletes the extensible attribute row, as applicable

LOAD_EXTENSIBLE_ATTRIBUTE

This API loads a single attribute value for a given attribute group for the specified project and task.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The following table shows which parameters for this procedure are required:

Name	Required
P_API_VERSION_NUMBER	Yes
P_TASK_ID	1 (See Parameter Requirements, page 3-87)
P_TASK_REFERENCE	1 (See Parameter Requirements, page 3-87)
P_ATTR_GRP_INTERNAL_NAME	2 (See Parameter Requirements, page 3-87)
P_ATTR_GRP_ID	2 (See Parameter Requirements, page 3-87)
P_ATTR_GRP_ROW_INDEX	Yes
P_ATTR_VALUE_STR	3 (See Parameter Requirements, page 3-87)
P_ATTR_VALUE_NUM	3 (See Parameter Requirements, page 3-87)
P_ATTR_VALUE_DATE	3 (See Parameter Requirements, page 3-87)

Parameter Requirements

In the preceding table, if the Required column contains a number, the following logic determines if a value is required:

Of the parameters that have the same number in the Required column, a value must be supplied for only one of the parameters. For example, P_TASK_ID and P_TASK_REFERENCE both have the number 1 in the Required column. A value must be supplied for either P_TASK_ID or P_TASK_REFERENCE.

LOAD_EXTENSIBLE_ATTRIBUTES

This is a bulk load API which loads the attribute values in a batch of 1000 attributes per API call. This procedure calls the LOAD_EXTENSIBLE_ATTRIBUTE API.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The following table shows the required parameters for this procedure:

Name	Required
P_TASK_ID	1 (See Parameter Requirements, page 3-87)
P_TASK_REFERENCE	1 (See Parameter Requirements, page 3-87)
P_ATTR_GRP_INTERNAL_NAME	2 (See Parameter Requirements, page 3-87)
P_ATTR_GRP_ID	2 (See Parameter Requirements, page 3-87)
P_ATTR_GRP_ROW_INDEX	Yes
P_ATTR_VALUE_STR	3 (See Parameter Requirements, page 3-87)
P_ATTR_VALUE_NUM	3 (See Parameter Requirements, page 3-87)
P_ATTR_VALUE_DATE	3 (See Parameter Requirements, page 3-87)

Using the User-Defined Attribute APIs

One feature of user-defined attributes is support for single- and multi-row attributes. This is an important concept to consider when you integrate user-defined attributes from an external system.

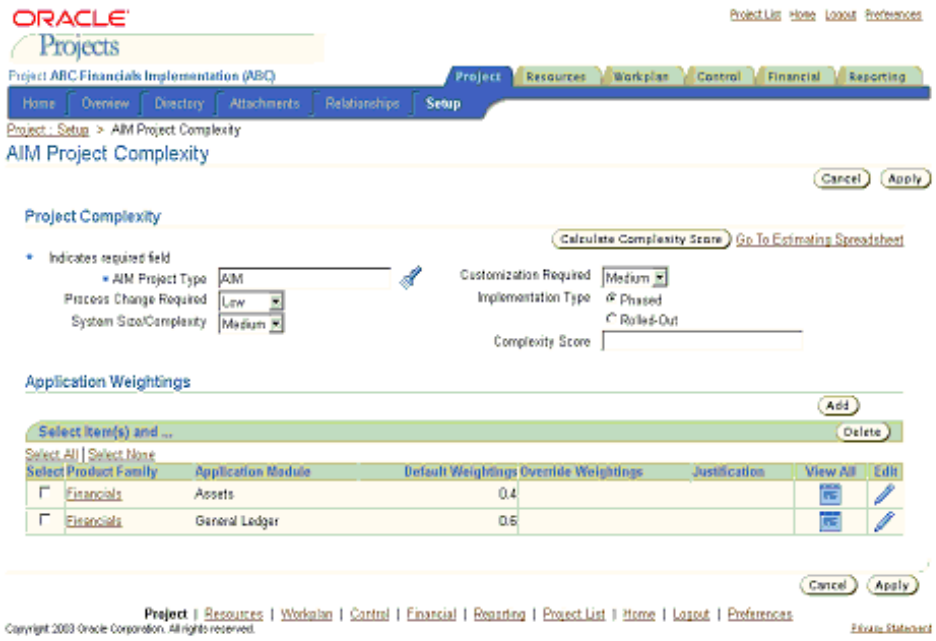
Single- and Multi-Row Attribute Groups

In this example, two attribute groups are defined for a project. The attribute groups are Project Complexity and Application Weightings.

Project Complexity is a single-row attribute group, which shows many records of information. Each record is displayed in a row in the table, with several columns across the page.

The following illustration shows how these groups appear in an entry screen.

Example of Attribute Groups in an Entry Screen



Integrating Single-Row Attribute Groups

The following table shows the data in the single-row attribute group *Project Complexity*.

Attribute	Value
AIM Project Type	AIM
Process Change Required	Low

Attribute	Value
System Size/Complexity	Medium
Customization Required	Medium
Complexity Score	[blank]

To load this information using a bulk approach with the API LOAD_EXTENSIBLE_ATTRIBUTES, a PL/SQL record is used to load each cell in the table. All the cells in a single row aredentified by using a common Attribute Row Identified.

> **Note:** Alternatively, the attribute/value pairs could be loaded one at a time using the LOAD_EXTENSIBLE_ATTRIBUTE API.

The following table illustrates how the Attribute Row Identifier puts the attributes into a single row.

PL/SQL Record Number	Attribute Row Identifier	Internal Attribute Group Name	Internal Attribute Name	Attribute Value (String)	Attribute Value (Number)	Attribute Value (Date)
1	1	Project Complexity	AIM Project Type	AIM	[blank]	[blank]
2	1	Project Complexity	Process Change Required	Low	[blank]	[blank]
3	1	Project Complexity	System Size/Complexity	Medium	[blank]	[blank]
4	1	Project Complexity	Customization Required	Medium	[blank]	[blank]
5	1	Project Complexity	Implementation Type	Phased	[blank]	[blank]
6	1	Project Complexity	Complexity Score	[blank]	[blank]	[blank]

Integrating Multi-Row Attribute Groups

The following table shows the data in the multi-row attribute group *Application Weightings*.

Product Family	Application Module	Default Weightings
Financials	Assets	0.4
Financials	General Ledger	0.6

To load the information shown here, a PL/SQL record is used to load each cell in the table above. All the cells in a single row can be identified by using a common Attribute Row Identified.

The following table shows the logical approach for loading this information using the LOAD_EXTENSIBLE_ATTRIBUTES bulk load API.

This example illustrates how the Attribute Row Identifier is used to group the attributes into a single row. Using the bulk load approach, you can load several attribute groups (both single- and multi-row) in one call to the API.

PL/SQL Record Number	Attribute Row Identifier	Internal Attribute Group Name	Internal Attribute Name	Attribute Value (String)	Attribute Value (Number)	Attribute Value (Date)
1	1	Application Weightings	Product Family	Financials	[blank]	[blank]
2	1	Application Weightings	Application Module	Assets	[blank]	[blank]
3	1	Application Weightings	Default Weighting	[blank]	0.4	[blank]
4	1	Application Weightings	Product Family	Financials	[blank]	[blank]
5	1	Application Weightings	Application Module	General Ledger	[blank]	[blank]
6	1	Application Weightings	Default Weighting	[blank]	0.6	[blank]

Example of Using the LOAD_EXTENSIBLE_ATTRIBUTE API

The following sample script shows how you can use the LOAD_EXTENSIBLE_ATTRIBUTE API to integrate a single attribute/value pair for a user-defined attribute group.

```
/*
Name: EATESTPACKAGE.SQL
Purpose: Package for the project amg api procedures' wrappers.
*/
create or replace package pa_EA_test as
procedure create_project_EA(
created_from_project_id number
,project_name varchar2
);
end pa_EA_test;
/
CREATE OR REPLACE PACKAGE BODY PA_EA_TEST as
procedure create_project_EA(
created_from_project_id number
,project_name varchar2
) as
--This package is an example of how the LOAD_EXTENSIBLE_ATTRIBUTE API
can be used
--to integrate a single attribute/value pair for a user-defined
attribute group.

--variables needed to create task hierarchy
level1 number;
level2 number;
level3 number;
a number := 0;
m number := 0;
parent_level1 varchar2(30);
parent_level2 varchar2(30);
parent_level3 varchar2(30);
parent_level4 varchar2(30);
parent_level5 varchar2(30);
number_of_tasks1 number;
number_of_tasks2 number;
number_of_tasks3 number;
number_of_tasks4 number;
number_of_tasks5 number;
number_of_tasks6 number;
temp_msg_data varchar2(2000);

--variables needed for api standard parameters
l_api_version_number number := 1.0;
l_commit varchar2(1) := 'T';
l_return_status varchar2(1);
l_init_msg_list varchar2(1) := 'T';
l_msg_data varchar2(2000);
l_msg_entity varchar2(100);
l_msg_entity_index number;
l_msg_index number;
l_encoded varchar2(1);
l_work_flow_started varchar2(1);
t1 varchar2(10);
t2 varchar2(100);
l_data varchar2(200);
t3 varchar2(2000);
l_msg_count number;
l_msg_index_out number;

--variables needed for oracle project specific parameters
l_created_from_project_id number;
l_pm_product_code varchar2(10);
```

```
l_number_of_task_levels number;
l_project_name varchar2(30);
l_project_number varchar2(80);
l_pm_project_reference varchar2(25);
l_project_status_code varchar2(30);
l_distribution_rule varchar2(30);
l_public_sector_flag varchar2(1);
l_carrying_out_organization_id number;
l_start_date date;
l_completion_date date;
l_actual_start_date date;
l_actual_finish_date date;
l_early_start_date date;
l_early_finish_date date;
l_late_start_date date;
l_late_finish_date date;
l_person_id number;
l_project_role_type varchar2(20);
l_class_category varchar2(30);
l_class_code varchar2(30);
l_project_id number(15);
l_pa_project_number varchar2(25);
l_project_description varchar2(250);
l_customer_id number;
l_project_relationship_code varchar2(30);
l_task_id number(15);
l_pm_task_reference varchar2(25);
l_task_index number;
project_loop number;
l_tasks_in pa_project_pub.task_in_tbl_type;
l_task_rec pa_project_pub.task_in_rec_type;
l_key_member_rec pa_project_pub.project_role_rec_type;
l_key_member_tbl pa_project_pub.project_role_tbl_type;
l_task_return_status varchar2(1);
l_short_name varchar2(10);
l_role_list_id number;
l_work_type_id number;
l_calendar_id number;
l_location_id number;
l_probability_member_id number;
l_project_value number;
l_opp_value_currency_code varchar2(15) := 'USD';
l_expected_approval_date date;
api_error exception;
l_org_member_rec pa_project_pub.project_role_rec_type;
l_org_member_tbl pa_project_pub.project_role_tbl_type;
l_task_version_id number;
l_encoded_msg varchar2(4000);
l_decoded_msg varchar2(4000);
l_final_msg varchar2(4000);
l_structure_type varchar2(25);
l_structure_version_name varchar2(25);
l_structure_version_id varchar2(25);
l_structure_description varchar2(150);
l_long_name varchar2(80);
v_time_before number;
l_ATTR_GRP_ROW_INDEX number;
l_ATTR_GRP_INTERNAL_NAME varchar2(15);
l_ATTR_INTERNAL_NAME varchar2(15);
l_ATTR_DISP_VALUE varchar2(15);
```

```
BEGIN
v_time_before := DBMS_UTILITY.get_time;
--PRODUCT RELATED DATA
l_pm_product_code := 'MSPROJECT';
--PROJECT DATA
l_created_from_project_id := created_from_project_id;
l_project_name := project_name;
l_project_number := project_name;
l_pm_project_reference := project_name;
l_project_description := project_name;
l_long_name := project_name;
l_project_status_code := '';
l_carrying_out_organization_id := 244;
l_start_date := '01-jan-00';
l_completion_date := '31-mar-05';
l_actual_start_date := '01-jan-01';
l_actual_finish_date := '01-apr-05';
l_early_start_date := '01-jan-01';
l_early_finish_date := '01-apr-05';
l_late_start_date := '01-jan-01';
l_late_finish_date := '01-APR-05';
l_role_list_id := 1000 ;
l_work_type_id := 10020;
l_calendar_id := 550;
l_location_id := 1;
l_probability_member_id := 1005;
l_project_value := 1000;
l_expected_approval_date := '31-mar-99';

--KEY MEMBERS DATA
l_key_member_rec.person_id := 53;
l_key_member_rec.project_role_type := 'PROJECT MANAGER';
l_key_member_tbl(1) := l_key_member_rec;
--CLASS CATEGORIES DATA
l_class_category := 'Product';
l_class_code := 'Non-classified';

-- EXTENSIBLE ATTRIBUTES DATA
l_ATTR_GRP_ROW_INDEX := 1;
l_ATTR_GRP_INTERNAL_NAME:= 'Project Complexity';
l_ATTR_INTERNAL_NAME := 'AIM Project Type';
l_ATTR_DISP_VALUE := 'AIM';
--TASKS DATA
-- Set the number of tasks for every level (there are 6 levels)
number_of_tasks1 := 5;
number_of_tasks2 := 2;
number_of_tasks3 := 0;
number_of_tasks4 := 0;
number_of_tasks5 := 0;
number_of_tasks6 := 0;
a := 0;
for level1 in 1..number_of_tasks1 loop
a:= a + 1;
l_task_rec.pm_task_reference := a;
l_task_rec.task_name := 'TOP LEVEL '|| a;
l_task_rec.pm_parent_task_reference := '';
l_task_rec.task_start_date := '01-jan-00';
l_task_rec.task_completion_date := '31-mar-05';
l_task_rec.actual_start_date := '01-JAN-01';
l_task_rec.actual_finish_date := '01-APR-05';
l_task_rec.early_start_date := '01-JAN-01';
```

```
l_task_rec.early_finish_date := '01-APR-05';
l_task_rec.late_start_date := '01-JAN-01';
l_task_rec.late_finish_date := '01-APR-05';
l_tasks_in(a) := l_task_rec;
parent_level1 := a;
FOR level2 IN 1..number_of_tasks2 LOOP
a := a + 1;
l_task_rec.pm_task_reference := a;
l_task_rec.task_name := '2 LEVEL '|| a;
l_task_rec.pm_parent_task_reference := parent_level1;
l_tasks_in(a) := l_task_rec;
parent_level2 := a;
for level3 IN 1..number_of_tasks3 loop
a := a + 1;
l_task_rec.pm_task_reference := a;
l_task_rec.task_name :='3 LEVEL '|| a;
l_task_rec.pm_parent_task_reference := parent_level2;
l_tasks_in(a) := l_task_rec;
parent_level3 := a;
for level4 IN 1..number_of_tasks4 loop
a := a + 1;
l_task_rec.pm_task_reference := a;
l_task_rec.task_name := '4 LEVEL '|| a;
l_task_rec.pm_parent_task_reference := parent_level3;
l_tasks_in(a) := l_task_rec;
for level5 IN 1..number_of_tasks5 loop
a := a + 1;
l_task_rec.pm_task_reference := a;
l_task_rec.task_name := '5 LEVEL '|| a;
l_task_rec.pm_parent_task_reference := parent_level4;
l_tasks_in(a) := l_task_rec;
for level6 IN 1..number_of_tasks6 loop
a := a + 1;
l_task_rec.pm_task_reference := a;
l_task_rec.task_name := '6 LEVEL '|| a;
l_task_rec.pm_parent_task_reference := parent_level5;
l_tasks_in(a) := l_task_rec;
end loop;--6th level
end loop;--5th level
end loop;--4th level
end loop;--3rd level
end loop;--2nd level
end loop;--1st level
-----------------------
dbms_output.put_line('Total tasks processed. '||l_tasks_in.count);
-----------------------

--INIT_CREATE_PROJECT
pa_project_pub.init_project;
-----------------------
--dbms_output.put_line('Before load_project');

--LOAD_PROJECT
pa_project_pub.load_project( p_api_version_number =>
l_api_version_number
,p_return_status => l_return_status
,p_created_from_project_id => l_created_from_project_id
,p_project_name => l_project_name
,p_long_name => l_long_name
,p_description => l_project_description
,p_pm_project_reference => l_pm_project_reference
```

```
,p_pa_project_number => l_project_number
,p_carrying_out_organization_id => l_carrying_out_organization_id
,p_public_sector_flag => l_public_sector_flag
,p_customer_id => l_customer_id
,p_project_status_code => l_project_status_code
,p_start_date => l_start_date
,p_completion_date => l_completion_date
,p_actual_start_date => l_actual_start_date
,p_actual_finish_date => l_actual_finish_date
,p_early_start_date => l_early_start_date
,p_early_finish_date => l_early_finish_date
,p_late_start_date => l_late_start_date
,p_late_finish_date => l_late_finish_date
,p_role_list_id => l_role_list_id
,p_work_type_id => l_work_type_id
,p_calendar_id => l_calendar_id
,p_location_id => l_location_id
,p_probability_member_id => l_probability_member_id
,p_project_value => l_project_value
,p_opp_value_currency_code => l_opp_value_currency_code
,p_expected_approval_date => l_expected_approval_date
,p_distribution_rule => l_distribution_rule);
if l_return_status != 'S' then
raise api_error;
end if;
-----------------------
dbms_output.put_line('Before Loading Extensible Attributes');
pa_project_pub.load_extensible_attribute(
p_api_version_number => l_api_version_number,
x_return_status => l_return_status,
P_ATTR_GRP_ROW_INDEX => l_ATTR_GRP_ROW_INDEX,
P_ATTR_GRP_INTERNAL_NAME => l_ATTR_GRP_INTERNAL_NAME,
P_ATTR_INTERNAL_NAME => l_ATTR_INTERNAL_NAME,
P_ATTR_DISP_VALUE => l_ATTR_DISP_VALUE );
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
-----------------------
--dbms_output.put_line('Before load_structure');
--LOAD_PROJECT
l_structure_type := 'FINANCIAL';
pa_project_pub.load_structure(
p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_structure_type => l_structure_type
);
if l_return_status != 'S' then
raise api_error;
end if;
-----------------------

--LOAD_KEY_MEMBER (loop for multiple key members)
pa_project_pub.load_key_member(
p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_person_id => l_key_member_tbl(1).person_id
,p_project_role_type => l_key_member_tbl(1).project_role_type
);
IF l_return_status != 'S' THEN
RAISE API_ERROR;
```

```
END IF;
-----------------------
--dbms_output.put_line('bef load task');
-----------------------

--LOAD_TASK (loop for multiple tasks)
FOR i IN 1..a LOOP
pa_project_pub.load_task(
p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_pm_task_reference => l_tasks_in(i).pm_task_reference
,p_task_name => l_tasks_in(i).task_name
,p_pm_parent_task_reference => l_tasks_in(i).pm_parent_task_reference
,p_task_start_date => l_tasks_in(i).task_start_date
,p_task_completion_date => l_tasks_in(i).task_completion_date
,p_actual_start_date => l_tasks_in(i).actual_start_date
,p_actual_finish_date => l_tasks_in(i).actual_finish_date
,p_early_start_date => l_tasks_in(i).early_start_date
,p_early_finish_date => l_tasks_in(i).early_finish_date
,p_late_start_date => l_tasks_in(i).late_start_date
,p_late_finish_date => l_tasks_in(i).late_finish_date
,p_address_id => l_tasks_in(i).address_id
);
IF l_return_status != 'S' THEN
RAISE API_ERROR;
END IF;
END LOOP;
--dbms_output.put_line('bef execute create project');
-----------------------

--EXECUTE_CREATE_PROJECT
pa_project_pub.execute_create_project(
p_api_version_number => l_api_version_number
,p_commit => l_commit
,p_init_msg_list => 'T'
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_return_status => l_return_status
,p_workflow_started => l_work_flow_started
,p_pm_product_code => l_pm_product_code
,p_pa_project_id => l_project_id
,p_pa_project_number => l_pa_project_number
);
--dbms_output.put_line ('status '||l_return_status || ' msg count
'||l_msg_count);
IF l_return_status in( 'E', 'U' ) THEN
dbms_output.put_line( 'l_msg_data '||l_msg_data );
dbms_output.put_line( 'Error count '||l_msg_count );
l_msg_count := fnd_msg_pub.count_msg;
FOR l_counter IN REVERSE 1..l_msg_count LOOP
PA_UTILS.Get_Encoded_Msg(
p_index => l_counter
,p_msg_out => l_encoded_msg);
fnd_message.set_encoded(l_encoded_msg);
l_decoded_msg := fnd_message.get;
l_final_msg := l_final_msg || nvl(l_decoded_msg, l_encoded_msg);
dbms_output.put_line( 'ERROR MESSAGE CODE: '|| l_counter|| ' :
'||l_encoded_msg );
dbms_output.put_line( 'ERROR MESSAGE TEXT: '|| l_counter|| ' : '||
l_final_msg );
END LOOP;
```

```
ELSE
dbms_output.put_line( 'l_return_status '|| l_return_status|| '
'||l_msg_data
);
END IF;
IF l_return_status != 'S' THEN
RAISE API_ERROR;
END IF;
dbms_output.put_line ('Project Id '||l_project_id);
--dbms_output.put_line('bef execute fetch task');
-----------------------

--FETCH_TASK
FOR l_task_index in 1..a LOOP
pa_project_pub.fetch_task(
p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_task_index => l_task_index
,p_pa_task_id => l_task_id
,p_pm_task_reference => l_pm_task_reference
,p_task_return_status => l_task_return_status
);
IF l_return_status != 'S' OR l_task_return_status != 'S' THEN
dbms_output.put_line ('error text '|| SUBSTR (SQLERRM , 1 , 240));
RAISE API_ERROR;
END IF;
END LOOP;
--dbms_output.put_line('bef execute fetch str workplan');
-----------------------
--FETCH_TASK
pa_project_pub.fetch_structure_version(
p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_structure_type => 'WORKPLAN'
,p_pa_structure_version_id => l_task_version_id
,p_struc_return_status => l_task_return_status
);
IF l_return_status != 'S' THEN
dbms_output.put_line ('error text '|| SUBSTR (SQLERRM , 1 , 240));
RAISE API_ERROR;
ELSE
dbms_output.put_line (' Workplan Str ver id '||l_task_version_id );
END IF;
--dbms_output.put_line('bef execute fetch str financial');
pa_project_pub.fetch_structure_version(
p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_structure_type => 'FINANCIAL'
,p_pa_structure_version_id => l_task_version_id
,p_struc_return_status => l_task_return_status);
IF l_return_status != 'S' THEN
dbms_output.put_line ('error text '|| SUBSTR (SQLERRM , 1 , 240));
RAISE API_ERROR;
ELSE
dbms_output.put_line (' Financial Str ver id '||l_task_version_id );
END IF;
-----------------------

--CLEAR_CREATE_PROJECT
pa_project_pub.clear_project;
IF l_return_status != 'S' THEN
```

```
RAISE API_ERROR;
END IF;
-----------------------
--HANDLE EXCEPTIONS
--COMMIT;
DBMS_OUTPUT.put_line('Time elapsed in secs :' || (DBMS_UTILITY.get_time
-
v_time_before)/(100));
EXCEPTION
WHEN API_ERROR THEN
dbms_output.put_line( 'In Exception' );
for i in 1..l_msg_count loop
pa_interface_utils_pub.get_messages(
p_data => l_data
,p_msg_index => i
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_msg_index_out => l_msg_index_out
);
dbms_output.put_line ('error mesg '||l_data);
end loop;
end create_project_EA;
end pa_ea_test;
/
```

Example of Using the LOAD_EXTENSIBLE_ATTRIBUTES API

The following sample script shows how you can use the LOAD_EXTENSIBLE_ATTRIBUTES API to load a multi-row attribute group with three attributes, with both string and number attributes.

```
REM Using the LOAD_EXTENSIBLE_ATTRIBUTES bulk call
REM Instructions to run this file to create a prjoject and add tasks to
FINANCIAL str.
REM Change the following parameters
REM l_created_from_project_id
REM l_project_name
REM l_project_number
REM l_pm_project_reference
REM l_project_description
REM l_long_name
REM
REM --Set the number of tasks for every level (there are 6 levels)
REM number_of_tasks1 := 2;
REM number_of_tasks2 := 3;
REM number_of_tasks3 := 0;
REM number_of_tasks4 := 0;
REM number_of_tasks5 := 0;
REM number_of_tasks6 := 0;
set serveroutput on;
execute dbms_application_info.set_client_info(458);
execute fnd_global.apps_initialize(1179, 20432, 275);
execute dbms_application_info.set_client_info(458);
-- PL/SQL example on how to create a project using the
LOAD/EXECUTE/FETCH
-- mechanism
DECLARE
--variables needed to create task hierarchy
level1 NUMBER;
level2 NUMBER;
level3 NUMBER;
a NUMBER := 0;
m NUMBER := 0;
parent_level1 VARCHAR2(30);
parent_level2 VARCHAR2(30);
parent_level3 VARCHAR2(30);
parent_level4 VARCHAR2(30);
parent_level5 VARCHAR2(30);
number_of_tasks1 NUMBER; -- number of tasks/level
number_of_tasks2 NUMBER;
number_of_tasks3 NUMBER;
number_of_tasks4 NUMBER;
number_of_tasks5 NUMBER;
number_of_tasks6 NUMBER;
temp_msg_data VARCHAR2(2000);
--variables needed for API standard parameters
l_api_version_number NUMBER :=1.0;
l_commit VARCHAR2(1):= 'F';
l_return_status VARCHAR2(1);
l_init_msg_list VARCHAR2(1);
l_msg_data VARCHAR2(2000);
l_msg_entity VARCHAR2(100);
l_msg_entity_index NUMBER;
l_msg_index NUMBER;
l_encoded VARCHAR2(1);
l_work_flow_started VARCHAR2(1);
t1 varchar2(10);
t2 varchar2(100);
l_data varchar2(200);
t3 VARCHAR2(2000);
l_msg_count NUMBER;
l_msg_index_out NUMBER;
```

```
--variables needed for Oracle Project specific parameters
l_created_from_project_id NUMBER;
l_pm_product_code VARCHAR2(10);
l_number_of_task_levels NUMBER;
l_project_name VARCHAR2(30);
l_project_number VARCHAR2(80);
l_pm_project_reference VARCHAR2(25);
l_project_status_code VARCHAR2(30);
l_distribution_rule VARCHAR2(30);
l_public_sector_flag VARCHAR2(1);
l_carrying_out_organization_id NUMBER;
l_start_date DATE;
l_completion_date DATE;
l_actual_start_date DATE;
l_actual_finish_date DATE;
l_early_start_date DATE;
l_early_finish_date DATE;
l_late_start_date DATE;
l_late_finish_date DATE;
l_person_id NUMBER;
l_project_role_type VARCHAR2(20);
l_class_category VARCHAR2(30);
l_class_code VARCHAR2(30);
l_project_id NUMBER(15);
l_pa_project_number VARCHAR2(25);
l_project_description VARCHAR2(250);
l_customer_id NUMBER;
l_project_relationship_code VARCHAR2(30);
l_task_id NUMBER(15);
l_pm_task_reference VARCHAR2(25);
l_task_index NUMBER;
project_loop NUMBER;
l_tasks_in pa_project_pub.task_in_tbl_type;
l_task_rec pa_project_pub.task_in_rec_type;
l_ea_rec
pa_project_pub.PA_EXT_ATTR_ROW_TYPE;
l_key_member_rec
pa_project_pub.project_role_rec_type;
l_key_member_tbl
pa_project_pub.project_role_tbl_type;
l_task_return_status VARCHAR2(1);
l_short_name VARCHAR2(10);
l_role_list_id NUMBER;
l_work_type_id NUMBER;
l_calendar_id NUMBER;
l_location_id NUMBER;
l_probability_member_id NUMBER;
l_project_value NUMBER;
l_opp_value_currency_code VARCHAR2(15) := 'USD';
l_expected_approval_date DATE;
API_ERROR EXCEPTION;
l_org_member_rec
pa_project_pub.project_role_rec_type;
l_org_member_tbl
pa_project_pub.project_role_tbl_type;
l_task_version_id NUMBER;
l_encoded_msg VARCHAR2(4000);
l_decoded_msg VARCHAR2(4000);
l_final_msg VARCHAR2(4000);
l_structure_type VARCHAR2(25);
l_structure_version_name VARCHAR2(25);
```

```
l_structure_version_id VARCHAR2(25);
l_structure_description VARCHAR2(150);
l_long_name VARCHAR2(80);
v_time_before NUMBER;

-- Extensible Attr variables;
l_row_identifier_arr pa_num_1000_num:= pa_num_1000_num();
l_attr_group_int_name pa_vc_1000_30 := pa_vc_1000_30();
l_attr_int_name pa_vc_1000_30 := pa_vc_1000_30();
l_attr_value_str pa_vc_1000_150 := pa_vc_1000_150();
l_attr_value_num pa_num_1000_num:= pa_num_1000_num();
l_attr_value_date pa_date_1000_date:= pa_date_1000_date();
BEGIN
v_time_before := DBMS_UTILITY.get_time;
PA_INTERFACE_UTILS_PUB.Set_Global_Info(
p_api_version_number => l_api_version_number
,p_responsibility_id => 20432
,p_user_id => 1179
,p_advanced_proj_sec_flag => 'Y'
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_return_status => l_return_status
);
dbms_application_info.set_client_info(458);
for project_loop in 1..1 loop

--PRODUCT RELATED DATA
l_pm_product_code :='MSPROJECT';

--PROJECT DATA
l_created_from_project_id := 13086;
l_project_name := 'zk0425_11';
l_project_number := l_project_name;
l_pm_project_reference := l_project_name;
l_project_description := l_project_name;
l_long_name := 'Long name AMG project' ||
l_project_name;
l_project_status_code := '';
l_carrying_out_organization_id :=244;
l_start_date :='01-jan-94';
l_completion_date :='31-mar-15';
l_actual_start_date :='01-jan-94';
l_actual_finish_date :='01-apr-15';
l_early_start_date :='01-jan-94';
l_early_finish_date :='31-mar-15';
l_late_start_date :='01-jan-94';
l_late_finish_date :='31-mar-16';
l_role_list_id :=1000 ;
l_work_type_id :=10020;
l_calendar_id :=550;
l_location_id :=1;
l_probability_member_id :=1005;
l_project_value :=1000;
l_expected_approval_date := '31-mar-99';

--KEY MEMBERS DATA
m:= 1;
l_person_id :='56';
l_project_role_type :='PROJECT MANAGER';
--CLASS CATEGORIES DATA
l_class_category :='Product';
```

```
l_class_code :='Non-classified';

--TASKS DATA
--Set the number of tasks for every level (there are 6 levels)
number_of_tasks1 := 2;
number_of_tasks2 := 1;
number_of_tasks3 := 0;
number_of_tasks4 := 0;
number_of_tasks5 := 0;
number_of_tasks6 := 0;
a := 0;
for level1 in 1..number_of_tasks1 loop
a:= a + 1;
l_task_rec.pm_task_reference :=a;
l_task_rec.task_name :='TOP LEVEL '||a;
l_task_rec.pm_parent_task_reference :='';
l_task_rec.actual_start_date := '10-MAR-95';
l_task_rec.actual_finish_date := '06-JUL-10';
l_task_rec.early_start_date := '09-MAR-95';
l_task_rec.early_finish_date := '05-JUL-10';
l_task_rec.late_start_date := '09-MAR-95';
l_task_rec.late_finish_date := '05-JUL-10';
l_task_rec.scheduled_start_date := '01-jan-01';
l_task_rec.scheduled_finish_date := '31-dec-05';
l_tasks_in(a):= l_task_rec;
parent_level1:= a;
FOR level2 IN 1..number_of_tasks2 LOOP
a:= a + 1;
l_task_rec.pm_task_reference :=a;
l_task_rec.task_name :='2 LEVEL '||a;
l_task_rec.scheduled_start_date := '01-jan-02';
l_task_rec.scheduled_finish_date := '31-dec-07';
l_task_rec.pm_parent_task_reference := parent_level1;
l_tasks_in(a) := l_task_rec;
parent_level2 := a;
for level3 IN 1..number_of_tasks3 loop
a := a + 1;
l_task_rec.pm_task_reference := a;
l_task_rec.task_name :='3 LEVEL '||a;
l_task_rec.pm_parent_task_reference := parent_level2;
l_tasks_in(a) := l_task_rec;
parent_level3 := a;
for level4 IN 1..number_of_tasks4 loop
a := a + 1;
l_task_rec.pm_task_reference := a;
l_task_rec.task_name
:='Fourth LEVEL '||a;
l_task_rec.pm_parent_task_reference
:= parent_level3;
l_tasks_in(a) := l_task_rec;
for level5 IN 1..number_of_tasks5 loop
a := a + 1;
l_task_rec.pm_task_reference
:= a;
l_task_rec.task_name := 'Fifth LEVEL '||a;
l_task_rec.pm_parent_task_reference :=
parent_level4;
l_tasks_in(a) := l_task_rec;
for level6 IN 1..number_of_tasks6 loop
a := a + 1;
l_task_rec.pm_task_reference
```

```
:= a;
l_task_rec.task_name := 'Sixth LEVEL
'||a;
l_task_rec.pm_parent_task_reference :=
parent_level5;
l_tasks_in(a) := l_task_rec;
end loop; --6th level
end loop; --5th level
end loop; --4th level
end loop; --3rd level
END LOOP; --2nd level
end loop; --1st level
-----------------------
dbms_output.put_line('Total tasks processed. '||l_tasks_in.count);
--can be used to exit this script and see how many tasks should have
been
--created
-----------------------

--INIT_CREATE_PROJECT
pa_project_pub.init_project;
-----------------------
--dbms_output.put_line('Before load_project');

--LOAD_PROJECT
pa_project_pub.load_project( p_api_version_number =>
l_api_version_number
,p_return_status => l_return_status
,p_created_from_project_id =>
l_created_from_project_id
,p_project_name => l_project_name
,p_long_name => l_long_name
,p_description => l_project_description
,p_pm_project_reference => l_pm_project_reference
,p_pa_project_number => l_project_number
,p_carrying_out_organization_id =>
l_carrying_out_organization_id
,p_public_sector_flag => l_public_sector_flag
,p_customer_id => l_customer_id
,p_project_status_code => l_project_status_code
,p_start_date => l_start_date
,p_completion_date => l_completion_date
,p_actual_start_date => l_actual_start_date
,p_actual_finish_date => l_actual_finish_date
,p_early_start_date => l_early_start_date
,p_early_finish_date => l_early_finish_date
,p_late_start_date => l_late_start_date
,p_late_finish_date => l_late_finish_date
,p_role_list_id => l_role_list_id
,p_work_type_id => l_work_type_id
,p_calendar_id => l_calendar_id
,p_location_id => l_location_id
,p_probability_member_id=>l_probability_member_id
,p_project_value => l_project_value
,p_opp_value_currency_code =>
l_opp_value_currency_code
,p_expected_approval_date=>l_expected_approval_date
,p_distribution_rule => l_distribution_rule);
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
```

```
END IF;
-----------------------
--dbms_output.put_line('Before load_structure');
--LOAD_PROJECT
l_structure_type := 'FINANCIAL';
pa_project_pub.load_structure( p_api_version_number =>
l_api_version_number
,p_return_status => l_return_status
,p_structure_type => l_structure_type
);
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
-----------------------

--LOAD_CLASS_CATEGORY (loop for mulitple class categories-This example
has
-- only one )
FOR i IN 1..1 LOOP
pa_project_pub.load_class_category(
p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_class_category => l_class_category
,p_class_code => l_class_code );
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
END LOOP;
dbms_output.put_line('bef load task');
-----------------------

--LOAD_TASK (loop for multiple tasks)
FOR i IN 1..a LOOP
pa_project_pub.load_task( p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_pm_task_reference =>
l_tasks_in(i).pm_task_reference
,p_task_name =>
l_tasks_in(i).task_name
,p_pm_parent_task_reference =>
l_tasks_in(i).pm_parent_task_reference
,p_task_start_date =>
l_tasks_in(i).task_start_date
,p_task_completion_date =>
l_tasks_in(i).task_completion_date
,p_actual_start_date =>
l_tasks_in(i).actual_start_date
,p_actual_finish_date =>
l_tasks_in(i).actual_finish_date
,p_early_start_date =>
l_tasks_in(i).early_start_date
,p_early_finish_date =>
l_tasks_in(i).early_finish_date
,p_late_start_date => l_tasks_in(i).late_start_date
,p_late_finish_date => l_tasks_in(i).late_finish_date
,p_scheduled_start_date => l_tasks_in(i).scheduled_start_date
,p_scheduled_finish_date => l_tasks_in(i).scheduled_finish_date
,p_address_id =>
l_tasks_in(i).address_id);
```

```
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
END LOOP;
-----------------------
dbms_output.put_line('bef load ext attr');

--LOAD_EXTENSIBLE_ATTRIBUTE
l_row_identifier_arr.extend;
l_attr_group_int_name.extend;
l_attr_int_name.extend;
l_attr_value_str.extend;
l_attr_value_num.extend;
l_attr_value_date.extend;
l_row_identifier_arr(1) := 1;
l_attr_group_int_name(1) := 'Application Weightings';
l_attr_int_name(1) := 'Product Family';
l_attr_value_str(1) := 'Financials';
l_row_identifier_arr.extend;
l_attr_group_int_name.extend;
l_attr_int_name.extend;
l_attr_value_str.extend;
l_attr_value_num.extend;
l_attr_value_date.extend;
l_row_identifier_arr(2) := 1;
l_attr_group_int_name(2) := 'Application Weightings';
l_attr_int_name(2) := 'Application Module';
l_attr_value_str(2) := 'Assets';
l_row_identifier_arr.extend;
l_attr_group_int_name.extend;
l_attr_int_name.extend;
l_attr_value_str.extend;
l_attr_value_num.extend;
l_attr_value_date.extend;
l_row_identifier_arr(3) := 1;
l_attr_group_int_name(3) := 'Application Weightings';
l_attr_int_name(3) := 'Default Weighting';
l_attr_value_num(3) := 0.6;
l_row_identifier_arr.extend;
l_attr_group_int_name.extend;
l_attr_int_name.extend;
l_attr_value_str.extend;
l_attr_value_num.extend;
l_attr_value_date.extend;
l_row_identifier_arr(4) := 2;
l_attr_group_int_name(4) := 'Application Weightings';
l_attr_int_name(4) := 'Product Family';
l_attr_value_str(4) := 'Financials';
l_row_identifier_arr.extend;
l_attr_group_int_name.extend;
l_attr_int_name.extend;
l_attr_value_str.extend;
l_attr_value_num.extend;
l_attr_value_date.extend;
l_row_identifier_arr(5) := 2;
l_attr_group_int_name(5) := 'Application Weightings';
l_attr_int_name(5) := 'Application Module';
l_attr_value_str(5) := 'General Ledger';
l_row_identifier_arr.extend;
l_attr_group_int_name.extend;
```

```
l_attr_int_name.extend;
l_attr_value_str.extend;
l_attr_value_num.extend;
l_attr_value_date.extend;
l_row_identifier_arr(6) := 2;
l_attr_group_int_name(6) := 'Application Weightings';
l_attr_int_name(6) := 'Default Weighting';
l_attr_value_num(6) := 0.4;
dbms_output.put_line('bef load ext attr API CALL');
pa_project_pub.load_extensible_attributes(
p_api_version_number => l_api_version_number
,x_return_status => l_return_status
,P_ATTR_GRP_ROW_INDEX => l_row_identifier_arr
,P_ATTR_GRP_INTERNAL_NAME=> l_attr_group_int_name
,P_ATTR_INTERNAL_NAME => l_attr_int_name
,P_ATTR_VALUE_STR => l_attr_value_str
,P_ATTR_VALUE_NUM => l_attr_value_num
,P_ATTR_VALUE_DATE => l_attr_value_date
);
dbms_output.put_line('After load ext attr');
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
--dbms_output.put_line(after load ext attr');
-----------------------
--dbms_output.put_line('bef execute create project');
-----------------------

--EXECUTE_CREATE_PROJECT
pa_project_pub.execute_create_project(p_api_version_number =>
l_api_version_number
,p_commit => l_commit
,p_init_msg_list => 'F'
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_return_status => l_return_status
,p_workflow_started => l_work_flow_started
,p_pm_product_code => l_pm_product_code
,p_pa_project_id => l_project_id
,p_pa_project_number =>
l_pa_project_number
);
--dbms_output.put_line ('status '||l_return_status || ' msg count
'||l_msg_count);
IF l_return_status in( 'E', 'U' )
THEN
dbms_output.put_line( 'l_msg_data '||l_msg_data );
dbms_output.put_line( 'Error count '||l_msg_count );
l_msg_count := fnd_msg_pub.count_msg;
FOR l_counter IN REVERSE 1..l_msg_count LOOP
PA_UTILS.Get_Encoded_Msg(p_index => l_counter,
p_msg_out => l_encoded_msg);
fnd_message.set_encoded(l_encoded_msg);
l_decoded_msg := fnd_message.get;
l_final_msg := l_final_msg || nvl(l_decoded_msg, l_encoded_msg);
dbms_output.put_line( 'ERROR MESSAGE CODE: '|| l_counter|| ' :
'||l_encoded_msg );
dbms_output.put_line( 'ERROR MESSAGE TEXT: '|| l_counter|| ' : '||
l_final_msg );
END LOOP;
```

```
ELSE
dbms_output.put_line( 'l_return_status '|| l_return_status|| '
'||l_msg_data );
END IF;
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
dbms_output.put_line ('Project Id '||l_project_id);
--dbms_output.put_line('bef execute fetch task');
-----------------------

--FETCH_TASK
FOR l_task_index in 1..a LOOP
pa_project_pub.fetch_task( p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_task_index => l_task_index
,p_pa_task_id => l_task_id
,p_pm_task_reference => l_pm_task_reference
,p_task_return_status => l_task_return_status);
IF l_return_status != 'S'
OR l_task_return_status != 'S'
THEN
dbms_output.put_line ('error text '|| SUBSTR (SQLERRM , 1 , 240));
RAISE API_ERROR;
END IF;
END LOOP;
--dbms_output.put_line('bef execute fetch str workplan');
-----------------------

--FETCH_TASK
pa_project_pub.fetch_structure_version(
p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_structure_type => 'WORKPLAN'
,p_pa_structure_version_id => l_task_version_id
,p_struc_return_status =>
l_task_return_status);
IF l_return_status != 'S'
THEN
dbms_output.put_line ('error text '|| SUBSTR (SQLERRM , 1 , 240));
RAISE API_ERROR;
ELSE
dbms_output.put_line (' Workplan Str ver id '||l_task_version_id );
END IF;
--dbms_output.put_line('bef execute fetch str financial');
pa_project_pub.fetch_structure_version(
p_api_version_number => l_api_version_number
,p_return_status => l_return_status
,p_structure_type => 'FINANCIAL'
,p_pa_structure_version_id => l_task_version_id
,p_struc_return_status =>
l_task_return_status);
IF l_return_status != 'S'
THEN
dbms_output.put_line ('error text '|| SUBSTR (SQLERRM , 1 , 240));
RAISE API_ERROR;
ELSE
dbms_output.put_line (' Financial Str ver id '||l_task_version_id );
END IF;
-----------------------
```

```
--CLEAR_CREATE_PROJECT
pa_project_pub.clear_project;
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
-----------------------

--HANDLE EXCEPTIONS
end loop;
DBMS_OUTPUT.put_line (
'Time elapsed in secs :' ||
(DBMS_UTILITY.get_time - v_time_before) / (100)
);
EXCEPTION
WHEN API_ERROR THEN
dbms_output.put_line( 'In Exception'||sqlerrm );
for i in 1..l_msg_count loop
pa_interface_utils_pub.get_messages (
p_encoded => FND_API.G_TRUE,
p_data => l_data
,p_msg_index => i
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_msg_index_out => l_msg_index_out );
dbms_output.put_line ('error mesg :'||l_data);
end loop;
END ;
/
```

Resource APIs

You can keep track of and organize both labor and non-labor resources using the system that you prefer. Then, use the resource APIs to export your resource lists and the resources they include to Oracle Projects. Oracle Projects updates its resource information accordingly. As your resources and resource lists change, update the information in your system and periodically synchronize the two systems.

> **Note:** When youcall any resource API that requires a resource list identifier, pass either the P_RESOURCE_LIST_NAME or the P_RESOURCE_LIST_ID parameter to identify the resource list. When youcall any resource API that requires a resource identifier, pass either the P_RESOURCE_ALIAS or the P_RESOURCE_LIST_MEMBER_ID parameter to identify the resource.

Resource API Views

The following table lists the views that provide parameter data for the resource APIs. For detailed description of the views, refer to Oracle eTRM, which is available on Oracle *MetaLink.*

View	Description
PA_AMG_RESOURCE_INFO_V	Customize this view to retrieve information about resource list members.
PA_EMPLOYEES_RES_V	Displays information about all employees defined in your human resources application. You can define any employee returned by this view as a resource in Oracle Projects.
PA_EVENT_TYPES_RES_V	Displays event types defined in Oracle Projects. You can define any event type returned by this view as a resource in Oracle Projects.
PA_EXPEND_CATEGORIES_RES_V	Displays expenditure categories defined in Oracle Projects. You can define any expenditure category returned by this view as a resource in Oracle Projects.
PA_EXPENDITURE_TYPES_RES_V	Displays expenditure types defined in Oracle Projects. You can define any expenditure type returned by this view as a resource in Oracle Projects.
PA_JOBS_RES_V	Displays information about all the jobs defined in your human resources application. You can define any job returned by this view as a resource in Oracle Projects.
PA_LOWEST_LEVEL_RESOURCES_V	Retrieves Oracle Projects identification codes and names for resource lists and lowest-level resource list members.
PA_ORGANIZATIONS_RES_V	Displays information about the organizations defined in your human resources application. You can define any organization returned by this view as a resource in Oracle Projects.
PA_PROJ_ORG_STRUCTURES_V	Retrieves the organization hierarchy
PA_QRY_RESOURCE_LISTS_V	Retrieves resource lists defined in Oracle Projects
PA_QUERY_RES_LIST_MEMBERS_V	Retrieves members of a resource list defined in Oracle Projects
PA_RESOURCE_LIST_GROUPS_V	Retrieves resource groups in a resource list defined in Oracle Projects
PA_RESOURCE_LIST_V	Retrieves resource lists defined in Oracle Projects
PA_RESOURCE_TYPES_ACTIVE_V	Retrieves active resource types defined in Oracle Projects

View	Description
PA_REVENUE_CATEGORIES_RES_V	Displays revenue categories defined in Oracle Projects. You can define any revenue category returned by this view as a resource in Oracle Projects.
PA_VENDORS_RES_V	Displays information about vendors defined in Oracle Purchasing. You can define any vendor returned by this view as a resource in Oracle Projects.

Resource API Procedures

The procedures described in this section are listed below. The procedures are located in the public API package PA_RESOURCE_PUB.

- Resource List and Resource List Member Procedures
  - ADD_RESOURCE_LIST_MEMBER, page 3-112
  - CREATE_RESOURCE_LIST, page 3-113
  - DELETE_RESOURCE_LIST, page 3-115
  - DELETE_RESOURCE_LIST_MEMBER, page 3-116
  - SORT_RESOURCE_LIST_MEMBERS, page 3-116
  - UPDATE_RESOURCE_LIST, page 3-114
  - UPDATE_RESOURCE_LIST_MEMBER, page 3-117
- Load-Execute-Fetch Procedures
  - CLEAR_CREATE_RESOURCE_LIST, page 3-118
  - CLEAR_UPDATE_MEMBERS, page 3-118
  - EXEC_CREATE_RESOURCE_LIST, page 3-118
  - EXEC_UPDATE_RESOURCE_LIST, page 3-118
  - FETCH_RESOURCE_LIST, page 3-119
  - FETCH_PLAN_FORMAT
  - FETCH_RESOURCE_LIST MEMBER, page 3-118

- INIT_CREATE_RESOURCE_LIST, page 3-119
- INIT_UPDATE_RESOURCE_LIST, page 3-119
- LOAD_RESOURCE_LIST, page 3-120
- LOAD_RESOURCE_FORMAT
- LOAD_MEMBERS, page 3-119
- LOAD_PLANNING_RESOURCE

Resource API Procedure Definitions

This section contains description of the resource APIs, including business rules and parameters.

ADD_RESOURCE_LIST_MEMBER

ADD_RESOURCE_LIST_MEMBER is a PL/SQL procedure that adds a resource member to an existing resource list.

Business Rules

1. Calling modules can pass either the RESOURCE_LIST_NAME or the RESOURCE_LIST_ID.
2. If the calling modules pass both RESOURCE_LIST_NAME and RESOURCE_LIST_ID, the API uses the latter.
3. If the resource list is grouped, you must pass a valid resource group alias.
4. The value for P_RESOURCE_ATTR_VALUE must correspond to the value for P_RESOURCE_TYPE. For example, the person identification code for P_RESOURCE_ATTR_VALUE must be valid if P_RESOURCE_TYPE equals EMPLOYEE.

   Note: For more information about resource types in Oracle Projects, see Resource Types, *Oracle Projects Fundamentals*.

5. If the calling module passes information for both RESOURCE_GROUP and RESOURCE_MEMBER parameters to this API, the API first verifies that the resource group exists. If the resource group does not exist, the API creates the resource group and then creates the resource.

6. If a given resource member already exists, this API does not return an error. Instead, it returns a successful return status and the RESOURCE_LIST_MEMBER_ID of the existing resource member.

   Note: Because you can store only one transaction attribute for a given resource, this API accepts only a single RESOURCE_ATTR_VALUE, which may hold PERSON_ID, JOB_ID, and so on.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERS ION_NUMBER
- P_RESOURCE_ TYPE_CODE
- P_RESOURCE_ ATTR_VALUE
- P_RESOURCE_ ALIAS

CREATE_RESOURCE_LIST

CREATE_RESOURCE_LIST is a PL/SQL procedure that creates a resource list and optionally creates the resource list members.

This API uses composite datatypes. For more information, see APIs That Use Composite Datatypes, page 2-22.

Business Rules

- Valid values for P_GROUP_RESOURCE_TYPE are EXPENDITURE_CATEGORY, REVENUE_CATEGORY, ORGANIZATION, and NONE.
- The resource list name must be unique.
- If calling programs pass the P_MEMBER_TBL (optional), this API creates the relevant resource list member records.
- If your resource list is grouped, you must pass a valid resource group alias.
- The value for P_RESOURCE_ATTR_VALUE must correspond with the value for P_RESOURCE_TYPE. For example, the person identification code for P_RESOURCE_ATTR_VALUE must be valid if P_RESOURCE_TYPE equals EMPLOYEE.

- If the value for GROUP_RESOURCE_TYPE is NONE, this API will ignore resource group IN parameters.
- If you do not specify the resource group alias, the group resource type must be NONE.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERS ION_NUMBER
- RESOURCE_L IST_NAME
- GROUP_ RESOURCE_TYPE
- RESOURCE_TYPE_CODE
- RESOURCE_ ATTR_VALUE
- RESOURCE_ALIAS

UPDATE_RESOURCE_LIST

UPDATE_RESOURCE_LIST is a PL/SQL procedure that updates an existing resource list, including updating existing or adding new resource list members.

This API uses composite datatypes. For more information, see APIs That Use Composite Datatypes, page 2-22.

Business Rules

- Calling modules can pass either the RESOURCE_LIST_NAME or the RESOURCE_LIST_ID.
- If the calling modules pass both the RESOURCE_LIST_NAME and the RESOURCE_LIST_ID, this API uses the latter.
- You cannot change GROUPED_BY_TYPE if the resource list already contains active members.
- You can change the following fields at any time:
  - RESOURCE LIST NAME
  - DESCRIPTION

    - START DATE
    - END DATE
- You must enter a unique new resource list name.
- You can update existing or add new resource list members by including the member records in the MEMBER_TBL. If a resource list member already exists, you can update the following fields:
    - ALIAS. Specify the P_NEW_ALIAS.
    - SORT_ORDER. Specify the P_SORT_ORDER.

      Note: The alias must be unique within a resource group.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- RESOURCE_TYPE_CODE
- RESOURCE_ ATTR_VALUE
- RESOURCE_ALIAS

DELETE_RESOURCE_LIST

DELETE_RESOURCE_LIST is a PL/SQL procedure that deletes a given resource list.

Business Rules

- Calling modules can pass either the P_RESOURCE_LIST_NAME or the P_RESOURCE_LIST_ID.
- If calling modules pass both P_RESOURCE_LIST_NAME and the P_RESOURCE_LIST_ID, this API uses the latter.
- You cannot delete a resource list if:
    - You summarize project actuals by that resource list.
    - A budget uses that resource list.

- The list contains resource list members.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameter for this procedure is listed below:

- P_API_VERSION_NUMBER

DELETE_RESOURCE_LIST_MEMBER

DELETE_RESOURCE_LIST_MEMBER is a PL/SQL procedure that deletes a given resource list member.

Business Rules

- Calling modules can pass either the P_RESOURCE_LIST_NAME or the P_RESOURCE_LIST_ID. Calling modules can also pass the P_ALIAS or the P_ALIAS_MEMBER_ID.
- If the calling modules pass both P_RESOURCE_LIST_NAME and the P_RESOURCE_LIST_ID, this API uses the latter.
- You cannot delete a resource list member if:
  - You summarize project actuals by that resource list member.
  - A budget uses that resource list member.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

SORT_RESOURCE_LIST_MEMBERS

SORT_RESOURCE_LIST_MEMBERS is a PL/SQL procedure that updates the sort order for resource members in a given resource list.

Business Rules

- Calling modules can pass either the P_RESOURCE_LIST_NAME or the P_RESOURCE_LIST_ID.

- If the calling modules pass both the P_RESOURCE_LIST_NAME and the P_RESOURCE_LIST_ID, this API uses the latter.
- If you specify a resource group alias, this API sorts only resources below that resource group. Otherwise, this API sorts all resources in the resource list.
- You can sort resources by alias or resource name. Valid values for P_SORT_BY PARAMETER are ALIAS and RESOURCE_NAME.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_SORT_BY

UPDATE_RESOURCE_LIST_MEMBER

UPDATE_RESOURCE_LIST_MEMBER is a PL/SQL procedure that updates the alias and enables or disables the resource list members.

Business Rules

- Calling modules can pass either the P_RESOURCE_LIST_NAME or P_RESOURCE_LIST_ID.
- If the calling modules pass both the P_RESOURCE_LIST_NAME and the P_RESOURCE_LIST_ID, this API uses the latter.
- You can use the P_ENABLED_FLAG to enable or disable a resource member. If the parameter value is passed as NULL or something other than Y, the column value remains the same.

  Note: The alias must be unique within a resource group.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameter for this procedure is listed below:

- P_API_VERSION_NUMBER

CLEAR_CREATE_RESOURCE_LIST

CLEAR_CREATE_RESOURCE_LIST is a Load-Execute-Fetch procedure used to clear the global data structures set up during the Initialize step. There are no parameters for this API procedure.

CLEAR_UPDATE_MEMBERS

CLEAR_UPDATE_MEMBERS is a Load-Execute-Fetch procedure used to clear the global data structures that were set up during the Initialize step for the Load-Execute-Fetch update APIs.

EXEC_CREATE_RESOURCE_LIST

EXEC_CREATE_RESOURCE_LIST is a Load-Execute-Fetch procedure used to execute the composite API CREATE_RESOURCE_LIST.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_RETURN_STATUS

EXEC_UPDATE_RESOURCE_LIST

EXEC_UPDATE_RESOURCE_LIST is a Load-Execute-Fetch procedure used to execute the composite API UPDATE_RESOURCE_LIST.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameter for this procedure is listed below:

- P_API_VERSION_NUMBER

FETCH_MEMBERS

FETCH_MEMBERS is a Load-Execute-Fetch procedure used to fetch resource members from the global output structure for resource list members.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameter for this procedure is listed below:

- P_API_VERSION_NUMBER

FETCH_RESOURCE_LIST

FETCH_RESOURCE_LIST is a Load-Execute-Fetch procedure used to fetch one resource list identifier at a time from the global output structure for resource lists.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameter for this procedure is listed below:

- P_API_VERSION_NUMBER

INIT_CREATE_RESOURCE_LIST

INIT_CREATE_RESOURCE_LIST is a Load-Execute-Fetch procedure used to set up the global data structures used by other Load-Execute-Fetch procedures.

INIT_UPDATE_MEMBERS

INIT_UPDATE_MEMBERS is a Load-Execute-Fetch procedure used to set up the global data structures used by other Load-Execute-Fetch procedures.

LOAD_MEMBERS

LOAD_MEMBERS is a Load-Execute-Fetch procedure used to load the resource list member global input structure.

Business Rules

- Calling modules can pass either P_RESOURCE_LIST_NAME or P_RESOURCE_LIST_ID.
- If the calling modules pass both P_RESOURCE_LIST_NAME and P_RESOURCE_LIST_ID, the API uses the latter.
- If the resource list is grouped, you must pass a valid resource group alias.
- The value for P_RESOURCE_ATTR_VALUE must correspond to the value for P_RESOURCE_TYPE. For example, person identification code for P_RESOURCE_ATTR_VALUE must be valid if P_RESOURCE_TYPE equals EMPLOYEE.

Note: For more information about resource types in Oracle Projects, see Resource Types, *Oracle Projects Fundamentals*.

- If the calling module passes information to this API for both resource group and resource member parameters, the API first verifies that the resource group exists. If the resource group does not exist, the API creates the resource group and then creates the resource.
- If a given resource member already exists, this API does not return an error. Instead, it returns a successful return status and the resource list member identification code of the existing resource member.

  Note: Because you can store only one transaction attribute for a given resource, this API accepts only a single RESOURCE_ATTR_VALUE, which may hold PERSON_ID, JOB_ID, and so on.

- You can use the P_ENABLED_FLAG to enable or disable a resource member. If the parameter value is passed as NULL or something other than Y, the column value remains the same.

  Note: The alias must be unique within a resource group.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameter for this procedure is listed below:

- P_API_VERSION_NUMBER

LOAD_RESOURCE_LIST

LOAD_RESOURCE_LIST is a Load-Execute-Fetch procedure used to load the resource list global input structure.

Business Rules

- Valid values for P_GROUP_RESOURCE_TYPE are EXPENDITURE_CATEGORY, REVENUE_CATEGORY, ORGANIZATION, and NONE.
- The resource list name must be unique.
- If calling programs pass the P_MEMBER_TBL (optional), this API creates the

relevant resource list member records.

- If your resource list is grouped, you must pass a valid resource group alias.
- The value for P_RESOURCE_ATTR_VALUE must correspond with the value for P_RESOURCE_TYPE. For example, P_RESOURCE_ATTR_VALUE must have a valid person identification code if P_RESOURCE_TYPE equals EMPLOYEE.
- If the value for GROUP_RESOURCE_TYPE is NONE, this API ignores resource group IN parameters.
- If you do not specify the resource group alias, the group resource type must be NONE.
- Calling modules can pass either P_RESOURCE_LIST_NAME or P_RESOURCE_LIST_ID.
- If the calling modules pass both P_RESOURCE_LIST_NAME and P_RESOURCE_LIST_ID, this API uses only the latter.
- If the resource list already contains active members, you cannot change GROUPED_BY_TYPE.
- You can change the following fields at any time:
  - RESOURCE_LIST_NAME
  - DESCRIPTION
  - START DATE
  - END DATE
- To update existing or add new resource list members, include the member records in MEMBER_TBL. If a resource list member already exists, you can update the following fields:
  - ALIAS. Specify P_NEW_ALIAS.
  - SORT_ORDER. Specify P_SORT_ORDER.
- You can use the value for P_ALIAS as the key to fetch the member record.

Note: The alias must be unique within a resource group.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of

this manual.

The required parameter for this procedure is listed below:

- P_API_VERSION_NUMBER

Planning Resource List APIs

This section discusses the APIs used in conjunction with planning resource lists.

Planning Resource List API Views

The following table lists the views that provide parameter data for the planning resource list APIs. The information returned in these views can be included in planning resources in Oracle Projects.

For detailed view descriptions, refer to Oracle eTRM, which is available on Oracle *MetaLink*.

View	Description
PA_EMPLOYEES_RES_V	Information about employees in the human resources system.
PA_EVENT_TYPES_RES_V	Displays information about event types defined in Oracle Projects.
PA_EXPEND_CATEGORIES_RES_V	Displays information about expenditure categories defined in Oracle Projects.
PA_EXPENDITURE_TYPES_RES_V	Displays information about expenditure types defined in Oracle Projects.
PA_JOBS_RES_V	Displays information about jobs defined in your human resources system.
PA_ORGANIZATIONS_RES_V	Displays information about organization defined in your human resources system.
PA_BOM_LABOR_RES_V	Displays information about BOM labor resources defined in your manufacturing system.
PA_BOM_EQUIPMENT_RES_V	Displays information about BOM equipment resources defined in your manufacturing system.
PA_ITEM_CATEGORY_RES_V	Displays information about item categories defined in your manufacturing system.

View	Description
PA_ITEMS_RES_V	Displays information about items defined in your manufacturing system.
PA_NON_LABOR_RESOURCES_RES_V	Displays information about non-labor resources defined in Oracle Projects.
PA_RESOURCE_CLASS_RES_V	Displays information about resource classes defined in Oracle Projects.
PA_PROJECT_ROLES_RES_V	Displays information about project roles defined in Oracle Projects.
PA_VENDORS_RES_V	Displays information about vendors defined in your Purschasing system.
PA_PERSON_TYPE_RES_V	Displays information about person types in your human resources system.
PA_REVENUE_CATEGORIES_RES_V	Displays information about revenue categories defined in Oracle Projects.

Planning Resource List API Procedures

The procedures described in this section are listed below. The procedures are located in the public API package PA_PLAN_RES_LIST_PUB.

- Planning Resource List and Planning Resource List Member Procedures
  - CREATE_RESOURCE_LIST, page 3-131
  - UPDATE_RESOURCE_LIST, page 3-132
  - DELETE_RESOURCE_LIST, page 3-133
  - DELETE_PLANNING_RESOURCE, page 3-134
  - DELETE_PLAN_RL_FORMAT, page 3-135
- Load-Execute-Fetch Procedures
  - EXEC_CREATE_RESOURCE_LIST, page 3-135
  - EXEC_UPDATE_RESOURCE_LIST, page 3-136
  - FETCH_RESOURCE_LIST, page 3-136

- FETCH_PLAN_FORMAT, page 3-136
- FETCH_RESOURCE_LIST_MEMBER, page 3-137
- INIT_CREATE_RESOURCE_LIST, page 3-137
- INIT_UPDATE_RESOURCE_LIST, page 3-137
- LOAD_RESOURCE_LIST, page 3-137
- LOAD_RESOURCE_FORMAT, page 3-139
- LOAD_PLANNING_RESOURCE, page 3-139

Planning Resource List API Record and Table Datatypes

The record and table datatypes used by the planning resource list APIs are defined on the following pages.

Plan_Res_List_IN_Rec Datatype Parameters

This is the planning resource list record structure. You need to pass the planning resource list record whenever you are creating a planning resource list, or when you are updating an existing planning resource list. You have to pass the default attributes only if you need to modify them.

Name	Type	Description
P_RESOURCE_LIST_ID	NUMBER	The resource list identifier. A value is passed only when you update the resource list. The value comes from PA_RESOURCE_LISTS_V.
P_RESOURCE_LIST_NAME	VARCHAR2 (80)	The resource list name
P_DESCRIPTION	VARCHAR2 (255)	The resource list description
P_START_DATE	DATE	The resource list start date, passed during resource list creation
P_END_DATE	DATE	The resource list end date

Name	Type	Description
P_JOB_GROUP_ID	NUMBER	The job group ID of the job associated with the resource list. This value comes from the view PA_JOBS_VIEW.
P_JOB_GROUP_NAME	VARCHAR2 (30)	The job group name of the job associated with the resource list. You can pass either the name or the P_JOB_GROUP_ID value.
P_USE_FOR_WP_FLAG	VARCHAR2 (1)	Flag to indicate whether the resource list can be associated with a workplan. Y indicates that the resource list will be used for workplan. N indicates that the resource list will not be used in workplan.
P_CONTROL_FLAG	VARCHAR2 (1)	Flag to indicate whether the resource list is centrally controlled or project specific. Y indicates that the resource list is centrally controlled. N indicates that the resource list is project specific.
P_RECORD_VERSION _NUMBER	NUMBER	The record version number of the resource list

Plan_Res_List_OUT_Rec Data Type Parameters

This is the planning resource list record structure, which stores the resource list identifier of the newly created planning resource list as an out parameter. The system passes this resource list identifier value when you create resource formats and resource list members.

Name	Type	Description
X_RESOURCE_LIST_ID	NUMBER	Resource list identifier of any new planning resource list

Plan_RL_Format_In_Tbl Data Type Parameters

The record type **Plan_RL_Format_In_Tbl** is a table of **Plan_RL_Format_In_Rec**.

Plan_RL_Format_In_Rec Data Type Parameters

This is the planning resource list format structure. You must pass the planning resource list format record when you create a resource format. You can add or delete resource formats while updating them. The following table shows the attributes of **Plan_RL_Format_In_Rec**.

Name	Type	Description
P_RES_FORMAT_ID	NUMBER	Resource format identifier, passed when adding a resource format to a resource list. The value can be obtained from PA_RES_FORMATS_AMG_V.

Plan_RL_Format_Out_Tbl Data Type Parameters

The record type **Plan_RL_Format_Out_Tbl** is a table of **Plan_RL_Format_Out_Rec**. The following table describes attributes of **Plan_RL_Format_Out_Rec**.

Plan_RL_Format_Out_Rec Data Type Parameters

This is the planning resource format record structure, which stores the resource list format identifier of the new resource list format as an out parameter.

Name	Type	Description
X_PLAN_RL_FORMAT_ID	NUMBER	Identifier of the new planning resource format
X_RECORD_VERSION_NUMBER	NUMBER	Record version number of the resource format

Planning_Resource_In_Tbl Data Type Parameters

The record type **Planning_Resource_In_Tbl** is a table of **Planning_Resource_In_Rec**. The following table describes attributes of **Planning_Resource_In_Rec**.

Planning_Resource_In_Rec Data Type Parameters

This is the planning resource list member record structure. You need to pass the resource list member record whenever you create or update a planning resource list. You must pass the default attributes only if you need to modify or update them.

Name	Type	Description
P_RESOURCE_LIST _MEMBER_ID	NUMBER	Optional resource list member identifier. A value is passed when updating a resource list member.

Name	Type	Description
P_RESOURCE_ALIAS	VARCHAR2 (80)	Alias name of the resource.
P_PERSON_ID	NUMBER	This parameter contains a value if the resource is of NAMED_PERSON type. It contains the selected resource identifier.
P_PERSON_NAME	VARCHAR2 (240)	This parameter contains a value if the resource is of NAMED_PERSON type. It contains the person name.
P_JOB_ID	NUMBER	This parameter contains a value if the resource is of JOB type. It contains job identifier.
P_JOB_NAME	VARCHAR2 (240)	This parameter contains a value if the resource is of JOB type. It holds the name of the selected resource
P_ORGANIZATION_ID	NUMBER	This parameter contains a value if the resource is of ORGANIZATION type. It holds the selected resource identifier. This sets the value for ORGANIZATION_ID of PA_RESOURCE_LIST_MEMBERS table.
P_ORGANIZATION _NAME	VARCHAR2 (30)	This parameter contains a value if the resource is of ORGANIZATION type. It holds the name of the selected resource.
P_VENDOR_ID	NUMBER	The vendor identifier. This sets the value of VENDOR_ID of PA_RESOURCE_LIST_MEMBERS table.
P_VENDOR_NAME	VARCHAR2 (240)	This holds the vendor name.
P_FIN_CATEGORY _NAME	VARCHAR2 (30)	This holds the financial category name.
P_NON_LABOR _RESOURCE	VARCHAR2 (30)	This parameter contains a value if the resource is of NON_LABOR_RESOURCE type. This holds the non labor resource name.

Name	Type	Description
P_PROJECT_ROLE_ID	NUMBER	This parameter contains a value if the resource is of ROLE type. It holds the selected resource identifier.
P_PROJECT_ROLE_NAME	VARCHAR2 (80)	This parameter contains a value if the resource is of ROLE type. It holds the name of the selected resource.
P_RESOURCE_CLASS_ID	NUMBER	This parameter contains the identifier of the resource class to which the resource belongs. It can take the following values: 1,2,3, or 4.
P_RESOURCE_CLASS_CODE	VARCHAR2 (30)	This parameter contains the code of the resource class to which the resource belongs. It can take the following values: EQUIPMENT, FINANCIAL ELEMENTS, MATERIAL ITEMS PEOPLE
P_RES_FORMAT_ID	NUMBER	It should be passed during creation of a planning resource list member. This holds the planning resource format ID to which the resource belongs.
P_SPREAD_CURVE_ID	NUMBER	Optional, defines the way cost or revenue amounts are distributed across periods for financial planning. This holds the identifier of the spread curves available. It sets the value for SPREAD_CURVE_ID of PA_RESOURCE_LIST_MEMBERS table. If P_SPREAD_CURVE_ID is NULL, then SPREAD_CURVE_ID is set to its default value decided by the resource class passed in. If P_SPREAD_CURVE_ID is NOT NULL, then SPREAD_CURVE_ID is set to whatever is passed.
P_ETC_METHOD_CODE	VARCHAR2 (30)	Optional, users can setup Estimate to Complete (ETC) Methods by resource. This planning attribute holds the corresponding ETC code. P_ETC_METHOD_CODE sets the value for ETC_METHOD_CODE of PA_RESOURCE_LIST_MEMBERS table. If P_ETC_METHOD_CODE is NULL then ETC_METHOD_CODE is set to its default value decided by the resource class passed in.If P_ETC_METHOD_CODE is NOT NULL then ETC_METHOD_CODE is set to whatever is passed.

Name	Type	Description
P_MFC_COST _TYPE_ID	NUMBER	Optional, holds the manufacturing cost type identifier. It sets the value for MFC_COST_TYPE_ID of PA_RESOURCE_LIST_MEMBERS table with whatever is passed in P_MFC_COST_TYPE_ID. If P_MFC_COST_TYPE_ID is NULL and the resource type is either BOM EQUIPMENT or BOM_LABOR or INVENTORY_ITEM then MFC_COST_TYPE_ID is set to its default value decided by the resource class else MFC_COST_TYPE_ID is set to NULL.
P_COPY_FROM _RL_FLAG	VARCHAR2	
P_RESOURCE _CLASS_FLAG	VARCHAR2	
P_FC_RES_TYPE _CODE	VARCHAR2 (30)	Decides the value for WP_ELIGIBLE_FLAG of PA_RESURCE_LIST_MEMBERS table. Based on this code WP_ELIGIBLE_FLAG is set to either 'Y' or 'N'. If P_FC_RES_TYPE_CODE is either 'REVENUE_CATEGORY' or 'EVENT_TYPE' then WP_ELIGIBLE_FLAG will hold 'N' else 'Y'.
P_INVENTORY_ITEM _ID	NUMBER	This parameter contains a value if the resource is of ITEM type. It contains the resource identifier.
P_INVENTORY_ITEM _NAME	VARCHAR2 (80)	This parameter contains a value if the resource is of ITEM type. It holds the selected resource name.
P_ITEM_CATEGORY _ID	NUMBER	This parameter contains a value if the resource is of ITEM CATEGORY type. It holds the selected resource identifier.
P_ITEM_CATEGORY _NAME	VARCHAR2 (150)	This parameter contains a value if the resource is of ITEM CATEGORY type. It holds the selected resource name.
P_MIGRATION_CODE	VARCHAR2	

Name	Type	Description
P_ATTRIBUTE _CATEGORY	VARCHAR2 (150)	The attribute category name
P_ATTRIBUTE1 TO P_ATTRIBUTE30	VARCHAR2 (150)	The descriptive flexfields enable users to define additional information for each planning resource
P_PERSON_TYPE _CODE	VARCHAR2 (30)	This parameter contains a value if the resource is of PERSON_TYPE type. It is the person type code or name.
P_BOM_RESOURCE _ID	NUMBER	This parameter contains a value if the resource is of BOM_LABOR or BOM_EQUIPMENT type.It holds the selected resource identifier.
P_BOM_RESOURCE _NAME	VARCHAR2 (30)	This parameter contains a value if the resource is of BOM_LABOR or BOM_EQUIPMENT type.It holds the selected resource name.
P_TEAM_ROLE	VARCHAR2 (80)	This parameter contains a value if the resource is of NAMED_ROLE type. It holds the team role name or code.
P_INCUR_BY_RES _CODE	VARCHAR2 (30)	This parameter contains a value if the resource belongs to a format having Incurred By Resource as planning resource element. It holds the selected resource code.
P_INCUR_BY_RES _TYPE	VARCHAR2 (30)	This parameter contains a value if the resource belongs to a format having Incurred By Resource as planning resource element.
P_RECORD _VERSION_NUMBER	NUMBER	This required attribute is the record version number of the resource list member. It has significance during the update of the resource list member.
P_PROJECT_ID	NUMBER	Required, holds the project ID for project specific resources. It determines the value for OBJECT_TYPE and OBJECT_ID of PA_RESOURCE_LIST_MEMBERS table. If PROJECT_ID is NOT NULL, OBJECT_TYPE and OBJECT_ID takes values PROJECT and PROJECT_ID. If PROJECT_ID is NULL, then it takes RESOURCE_LIST and P_RESOURCE_LIST_ID as OBJECT_TYPE and OBJECT_ID.

Name	Type	Description
P_ENABLED_FLAG	VARCHAR2 (1)	This optional attribute indicates whether or not the resource member is enabled. The value need not be passed unless you want to modify its value during update. ENABLED_FLAG will always be Y during creation of a resource list member. Y = The resource list member is enabled. N = The resource list member is disabled.

Planning_Resource_Out_Tbl Data Type Parameters

The record type **Planning_Resource_Out_Tbl** is a table of **Planning_Resource_Out_Rec**. The following table describes attributes of **Planning_Resource_Out_Rec**.

Planning_Resource_Out_Rec Data Type Parameters

This is the planning resource list member record structure, which stores the resource list member identifier of the new resource list member as an out parameter.

Name	Type	Description
X_RESOURCE_LIST_MEMBER_ID	NUMBER	Identifier of the new resource list member
X_RECORD_VERSION_NUMBER	NUMBER	Record version number of the resource list member

Planning Resource List API Definitions

This section contains descriptions of the planning resource list APIs, including business rules and parameters.

CREATE_RESOURCE_LIST

CREATE_RESOURCE_LIST is a PL/SQL procedure that enables users to create resource lists, corresponding resource formats, and resource list members.

This API uses composite datatypes. For more information, see APIs That Use Composite Datatypes, page 2-22.

Business Rules

- CREATE_RESOURCE_LIST validates the resource list parameters and creates the

resource list.

- If the system creates the resource list successfully, it then creates resource formats and passes them as parameters to CREATE_RESOURCE_LIST.
- If the system cannot add a resource format to the resource list, the API fails.
- If the system adds the resource formats successfully, it then processes the planning resources. If it fails to create any planning resource, the API fails.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PLAN_RES_LIST_REC
- P_PLAN_RL_FORMAT_TBL
- P_PLANNING_RESOURCE_IN_TBL

UPDATE_RESOURCE_LIST

UPDATE_RESOURCE_LIST is a PL/SQL procedure that enables you to update a resource list, corresponding resource formats, and planning resources. Since a resource format cannot be updated, it creates a resource format. It can also enable you to update existing planning resources or create a new planning resource if no planning resource exists.

This API uses composite datatypes. For more information, see APIs That Use Composite Datatypes, page 2-22.

Business Rules

- Calling modules can pass either the RESOURCE_LIST_NAME or the RESOURCE_LIST_ID.
- If the calling modules pass both the RESOURCE_LIST_NAME and the RESOURCE_LIST_ID, this API uses the latter.
- You can change the following fields at any time:
  - RESOURCE LIST NAME
  - DESCRIPTION
  - START DATE

    - END DATE

- You must enter a unique new resource list name.
- You can add new resource formats to the planning resource list by passing the formats P_PLAN_RL_FORMAT_TBL.
- You can update existing or addi new planning resources by passing the planning resources in P_PLANNING_RESOURCE_IN_REC.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PLAN_RES_LIST_REC
- X_PLAN_RES_LIST_REC
- P_PLAN_RL_FORMAT_TBL
- X_PLAN_RL_FORMAT_TBL
- P_PLANNING_RESOURCE_IN_TBL
- X_PLANNING_RESOURCE_OUT_TBL
- X_MSG_COUNT
- X_MSG_DATA
- X_RETURN_STATUS

DELETE_RESOURCE_LIST

DELETE_RESOURCE_LIST is a PL/SQL procedure that enables you to delete a resource list and corresponding planning resources and resource formats belonging to the resource list.

Business Rules

- Calling modules can pass either the P_RESOURCE_LIST_NAME or the P_RESOURCE_LIST_ID.
- When the planning resource list is deleted, all the resource formats and planning

resources belonging to that resource are also deleted.

- If calling modules pass both P_RESOURCE_LIST_NAME and the P_RESOURCE_LIST_ID, this API uses the latter.

- You cannot delete the planning resource list if it is referenced by a financial plan or workplan.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_RES_LIST_ID
- X_MSG_COUNT
- X_MSG_DATA
- X_RETURN_STATUS

DELETE_PLANNING RESOURCE

DELETE_PLANNING_RESOURCE is a PL/SQL procedure that enables you to delete a planning resource that is not in use or disable a planning resource that is in use.

Business Rule

The calling module passes a table containing valid resource list member IDs. This procedure deletes each list member if it is not in use, or disables it if it is in use. If the list member ID does not exist, the procedure does not raise an error message, and returns a Success result.

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_RESOURCE_LIST_MEMBER_ID
- X_RETURN_STATUS
- X_MSG_COUNT

- X_ERROR_MSG_DATA

DELETE_PLAN_RL_FORMAT

This procedure deletes one or more resource formats from a resource list.

Business Rule

The calling module has to pass in a table of valid resource format Ids and the ID of the resource list they belong to. The API will delete each format from the resource list if there are no planning resources of that format on the list. If any planning resources exist, the resource format cannot be deleted from the list.

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_RES_LIST_ID
- P_PLAN_RL_FORMAT_TB
- X_RETURN_STATUS
- X_MSG_COUNT
- X_ERROR_MSG_DATA

EXEC_CREATE_RESOURCE_LIST

EXEC_CREATE_RESOURCE_LIST is a Load-Execute-Fetch procedure used to execute the composite API CREATE_RESOURCE_LIST.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- X_RETURN_STATUS
- X_MSG_COUNT
- X_MSG_DATA

EXEC_UPDATE_RESOURCE_LIST

EXEC_UPDATE_RESOURCE_LIST is a Load-Execute-Fetch procedure used to execute the composite API UPDATE_RESOURCE_LIST.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- X_RETURN_STATUS
- X_MSG_COUNT
- X_MSG_DATA

FETCH_RESOURCE_LIST

FETCH_RESOURCE_LIST is a Load-Execute-Fetch procedure used to fetch one resource list identifier at a time from the global output structure for resource lists. It returns the status and the new RESOURCE_LIST_ID, if any.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- X_RETURN_STATUS
- X_RESOURCE_LIST_ID
- X_LIST_RETURN_STATUS

FETCH_PLAN_FORMAT

FETCH_PLAN_FORMAT is a Load-Execute-Fetch procedure that returns the planning resource format status and the new PLAN_RL_FORMAT_ID.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- X_RETURN_STATUS
- X_PLAN_RL_FORMAT_ID
- X_FORMAT_RETURN_STATUS

FETCH_RESOURCE_LIST_MEMBER

FETCH_RESOURCE_LIST_MEMBER is a Load-Execute-Fetch procedure that returns the resource list member status and the new RESOURCE_LIST_MEMBER_ID, if any exists.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- X_RETURN_STATUS
- X_RESOURCE_LIST_MEMBER_ID
- X_MEMBER_RETURN_STATUS

INIT_CREATE_RESOURCE_LIST

INIT_CREATE_RESOURCE_LIST is a Load-Execute-Fetch procedure used to set up the global temporary tables for resource formats and resource list members. It also initializes the record structure for the resource list. There are no parameters for this procedure.

INIT_UPDATE_RESOURCE_LIST

INIT_UPDATE_RESOURCE_LIST is a Load-Execute-Fetch procedure used to initialize the global temporary tables for the resource formats and resource list members. It also initializes the record structure for the resource list. There are no parameters for this procedure.

LOAD_RESOURCE_LIST

LOAD_RESOURCE_LIST is a Load-Execute-Fetch procedure that enables you to load the global record for a resource list with values.

Business Rules

- The following parameters must be passed when you create a new planning resource list
  - P_RESOURCE_LIST_NAME
  - P_START DATE
- The following parameters are optional when you create a new planning resource list:
  - P_DESCRIPTION
  - P_END_DATE
  - P_JOB_GROUP_ID
  - P_JOB_GROUP_NAME
  - P_USE_FOR_WP_FLAG
  - P_CONTROL_FLAG
- The following parameters can be updated when you update a planning resource list:
  - P_RESOURCE_LIST_NAME
  - P_START_DATE
  - P_DESCRIPTION
  - P_END_DATE
  - P_JOB_GROUP_ID
  - P_JOB_GROUP_NAME
  - P_USE_FOR_WP_FLAG
  - P_CONTROL_FLAG
- To identify which resource needs to be updated, you should pass the P_RESOURCE_LIST_ID identifier, which you can get from the PA_RESOURCE_LISTS_V view.

You can view descriptions of all of the parameters for this procedure in the Oracle

Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_RESOURCE_LIST_NAME
- P_DESCRIPTION
- P_JOB_GROUP_ID
- X_RETURN_STATUS

LOAD_RESOURCE_FORMAT

Enables you to load values into the global table for resource formats. This procedure populates the table and increments the count.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- X_RETURN_STATUS

LOAD_PLANNING_RESOURCE

Enables the user to load the global table for planning resources. This procedure populates the table and increments the count.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_RES_FORMAT_ID
- P_RECORD_VERSION_NUMBER
- P_PROJECT_ID

Resource Breakdown Structure APIs

This section discusses the APIs used in conjunction with resource breakdown structures. They enable you to create resource breakdown structures, assign them to projects, and update them.

Resource Breakdown Structure API Views

The following table lists the views that provide parameter data for the resource breakdown structure APIs. The information returned in these views can be included in resource breakdown structures in Oracle Projects.

For detailed description of the views, refer to Oracle eTRM, which is available on Oracle *MetaLink.*

View	Description
PA_EMPLOYEES_RES_V	Displays information about employees in the Human Resources system
PA_EVENT_TYPES_RES_V	Displays information about event types defined in Oracle Projects
PA_EXPEND_CATEGORIES_RES_V	Displays information about expenditure categories defined in Oracle projects
PA_EXPENDITURE_TYPES_RES_V	Displays information about expenditure types defined in Oracle projects
PA_JOBS_RES_V	Displays information about jobs defined in your Human resources system.
PA_ORGANIZATIONS_RES_V	Displays information about organization defined in your Human resources system.
PA_BOM_LABOR_RES_V	Displays information about BOM labor resources defined in your manufacturing system
PA_BOM_EQUIPMENT_RES_V	Displays information about BOM equipment resource defined in your manufacturing system
PA_ITEM_CATEGORY_RES_V	Displays information about item categories defined in your manufacturing system
PA_ITEMS_RES_V	Displays information about items defined in your manufacturing system.

View	Description
PA_NON_LABOR_RESOURCES_RES_V	Displays information about non-labor resources defined in Oracle Projects
PA_RESOURCE_CLASS_RES_V	Displays information about resource classes defined in Oracle Projects
PA_PROJECT_ROLES_RES_V	Displays information about project roles defined in Oracle Projects
PA_VENDORS_RES_V	Displays information about vendors defined in your Purschasing system
PA_PERSON_TYPE_RES_V	Displays information about person types in your Human resources system
PA_REVENUE_CATEGORIES_RES_V	Displays information about revenue categories defined in Oracle Projects
PA_RBS_HEADERS_AMG_V	Returns RBS Header information
PA_RBS_VERSIONS_AMG_V	View which returns RBS Version information
PA_RES_TYPES_AMG_V	View that returns resource types defined in the system. You need to pass the resource type while defining an element in the resource breakdown structure
PA_RBS_ELEMENTS_AMG_V	View that returns all the elements in a resource breakdown structure

Resource Breakdown Structure API Procedures

The procedures described in this section are listed below. The procedures are located in the public API package PA_RBS_PUB.

- Resource Breakdown Structure Procedures
  - CREATE_RBS, page 3-147
  - COPY_RBS_WORKING_VERSION, page 3-148
  - UPDATE_RBS, page 3-149
  - INIT_RBS_PROCESSING, page 3-150
  - LOAD_RBS_HEADER, page 3-150

Resource Breakdown Structure API Record and Table Datatypes

The record and table datatypes used by resource breakdown structure APIs are defined on the following pages.

Rbs_Header_Rec_Typ Datatype Parameters

This is the header record structure of the resource breakdown structure. When create or update a resource breakdown structure header, you must pass the resource breakdown structure. You only pass the default attributes if you need to modify them.

Name	Type	Description
RBS_HEADER_ID	NUMBER	The header identifier of the resource breakdown structure. The value is passed when the header is updated.
NAME	VARCHAR2 (240)	Resource breakdown structure name.
DESCRIPTION	VARCHAR2 (2000)	Resource breakdown structure description.

Name	Type	Description
EFFECTIVE_FROM_DATE	DATE	The date from which the resource breakdown structure can be used. Resource breakdown structures with effective from dates that are before the current date are eligible to be assigned to projects. EFFECTIVE_FROM_DATE cannot be NULL.
EFFECTIVE_TO_DATE	DATE	The date up to which the resource breakdown structure can be used. Resource breakdown structures with effective to dates that are on or after the current date are eligible to be assigned to projects.
EFFECTIVE_TO_DATE	NUMBER	The record version number of the resource breakdown structure header record (from the PA_RBS_HEADERS_AMG_V view).

Rbs_Version_Rec_Typ Datatype Parameters

This is the version record structure for the resource breakdown structure. When you create a resource breakdown structure, you pass the version record only if you want any specific version attributes. By default, the system creates a working version whenever you are creating a resource breakdown structure header. When you update a resource breakdown structure, you pass the version record only if you want to update version attributes such as version name or job group. You can update only the current working version. The version attributes can be read from the PA_RBS_VERSIONS_AMG_V view.

Name	Type	Description
RBS_VERSION_ID	NUMBER	The version identifier of the resource breakdown structure (RBS).
NAME	VARCHAR2 (240)	Resource breakdown structure version name
DESCRIPTION	VARCHAR2 (2000)	Resource breakdown structure version description
VERSION_START _DATE	DATE	The resource breakdown structure effective start date. The system uses this date to decide whether all the project transactions should be mapped to the version. If the date is before the system date, the system maps the transactions to this version.

Name	Type	Description
JOB_GROUP_ID	NUMBER	The job group identifier of the job group for the resource breakdown structure version. Jobs from this job group are eligible to be elements of the resource breakdown structure hierarchy. You can select the job group from the PA_JOB_GROUPS_VIEW view.
RECORD _VERSION_NUMBER	NUMBER	The record version number of the RBS version record from the PA_RBS_VERSIONS_AMG_V view

Rbs_Elements_Tbl_Typ Datatype Parameters

The record type **Rbs_Elements_Tbl_Typ** is a table of **Rbs_Elements_Rec_Typ**. The following table describes attributes of **Rbs_Elements_Rec_Typ**.

Rbs_Elements_Rec_Typ Datatype Parameters

This is the element record structure for the resource breakdown structure. Whenever you create or update a resource breakdown structure element, you pass the element record structure. You pass the default attributes only if you need to modify or update them.

Name	Type	Description
RBS_VERSION_ID	NUMBER	The resource breakdown structure's version identifier.
RBS_ELEMENT_ID	NUMBER	The resource breakdown structure's element's identifier. This is a required field in the update mode.
PARENT_ELEMENT_ID	NUMBER	The current element parent's element identifier.
RESOURCE_TYPE_ID	NUMBER	The resource type identifier of the element. You can get the value from PA_RES_TYPES_AMG_V view.
RESOURCE_SOURCE_ID	NUMBER	The resource identifier that makes up the resource breakdown structure element.
RESOURCE_SOURCE _CODE	VARCHAR 2 (240)	The source code of the resource breakdown structure element. It has a value if the resource type of the element is associated with the resource type code of REVENUE_CATEGORY or USER_DEFINED.

Name	Type	Description
ORDER_NUMBER	NUMBER	The order in which the elements should be displayed on a given level of the resource breakdown structure in project reporting.
PROCESS_TYPE	VARCHAR2	Type of processing required for the resource breakdown structure element. The valid values are:
	(1)	A Add element U Update element D Delete element and its children if the element exists
RBS_LEVEL	NUMBER	Level at which the element is placed in the resource breakdown structure. This value is passed when the element is created. The level can have a value between 1 and 10. 1 is reserved for the root element, which will be ignored during processing.
RECORD_VERSION_NUMBER	NUMBER	Record version number of the resource breakdown structure's element. It is passed when the element is updated or deleted. You can get the value from the PA_RBS_ELEMENTS_AMG_V view.
RBS_REF_ELEMENT_ID	NUMBER	Identifier used to distinguish each element processed at each RBS level. It is passed when the element is created. Each element must have a RBS_REF_ELEMENT_ID.
PARENT_REF_ELEMENT_ID	NUMBER	Indicates the element parent. If the RBS_LEVEL is 1 or 2 then it does not need to be populated. RBS_LEVEL 1 elements do not need parents. The RBS_LEVEL 2 elements parents are updated by the system from the root element's ID.

RESOURCE_SOURCE_ID

The RESOURCE_SOURCE_ID parameter is populated with the resource identifier that makes up the resource breakdown structure element. If the element is a rule, then the system passes -1 as the RESOURCE_SOURCE_ID. If the element is an instance, the system passes the resource identification code.

Following are the resource types with identification codes:

- BOM_LABOR: Get the BOM Labor ID from the PA_BOM_LABOR_RES_V view
- BOM_EQUIPMENT: Get the BOM Equipment ID from the PA_BOM_EQUIPMENT_RES_V view
- NAMED_PERSON: Get the Person ID from the PA_EMPLOYEES_RES_V view

- EVENT_TYPE: Get the Event ID from the PA_EVENT_TYPES_RES_V view
- EXPENDITURE_CATEGORY: Get the Expenditure Category ID from the PA_EXPEND_CATEGORIES_RES_V view
- EXPENDITURE_TYPE: Get the Expenditure Type ID from the PA_EXPENDITURE_TYPES_RES_V view
- ITEM_CATEGORY: Get the Item Category ID from the PA_ITEM_CATEGORY_RES_V view
- INVENTORY_ITEM: Get the Item ID from the PA_ITEMS_RES_V view
- JOB: Get the job ID from the PA_JOBS_RES_V view
- ORGANIZATION: Get the Organization ID from the PA_ORGANIZATIONS_RES_V view
- NON_LABOR_RESOURCE: Get the Non-Labor Resource ID from the PA_NON_LABOR_RESOURCES_RES_V view
- RESOURCE_CLASS: Get the Resource Class ID from PA_RESOURCE_CLASS_RES_V
- ROLE: Get the Project Role ID from the PA_PROJECT_ROLES_RES_V view
- SUPPLIER: Get the Vendor ID from the PA_VENDORS_RES_V view

Rbs_Elements_Tbl_Out_Typ Datatype Parameters

The record type **Rbs_Elements_Tbl_Out_Typ** is a table of **Rbs_Elements_Rec_Out_Typ**.

Rbs_Elements_Rec_Out_Typ Datatype Parameters

This is the element record structure for the resource breakdown structure that stores the output values of new resource breakdown structure elements. The following table describes attributes of **Rbs_Elements_Rec_Out_Typ**.

Name	Type	Description
RBS_ELEMENT_ID	NUMBER	The resource breakdown structure's element identifier for the new element

Resource Breakdown Structure API Procedure Definitions

This section contains descriptions of the resource breakdown structure APIs, including business rules and parameters.

CREATE_RBS

The CREATE_RBS procedure enables you to create a resource breakdown structure (RBS), which is composed of the RBS header, the RBS version, and it's elements of the hierarchy.

Business Rules

- CREATE_RBS creates a resource breakdown structure. At minimum, CREATE_RBS creates a header and a working version for a resource breakdown structure.
- If the version record is not populated, CREATE_RBS uses the data stored in the P_HEADER_REC parameter to create the version record.
- If the version information is passed, the version start date must be greater or equal to the effective from date of the header record.
- CREATE_RBS can also create the entire resource breakdown structure hierarchy if the elements of the hierarchy are passed.
- The root element of the hierarchy of a resource breakdown structure version is the version itself. The version is not an updatable element. The system ignores any alternative elements that you may provide.
- The following information must be passed for each element in the resource breakdown structure hierarchy:
  - RBS_LEVEL
  - PROCESS_TYPE
  - PARENT_RES_ELEMENT_ID
  - RESOURCE_TYPE_ID
  - RESOURCE_SOURCE_ID or RESOURCE_SOURCE_CODE

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_HEADER_REC
- X_RBS_HEADER_ID
- X_RBS_VERSION_ID
- X_ELEMENTS_TBL
- X_RETURN_STATUS
- X_MSG_COUNT
- X_ERROR_MSG_DATA

COPY_RBS_WORKING_VERSION

This procedure enables you to create a working version of a resource breakdown structure from an existing frozen version.

Business Rules

1. The calling module must pass one of the following:
   - a resource breakdown structure header (Name or ID) and the version number of a frozen resource breakdown structure version
   - the version ID of a frozen resource breakdown structure version

   This information specifies version that will be copied as the current working version. The existing working version will be overwritten by a copy of the specified frozen version.
2. The record version number of the current working version is also required for locking purposes.

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_REC_VERSION_NUMBER

- X_RETURN_STATUS
- X_MSG_COUNT
- X_ERROR_MSG_DATA

UPDATE_RBS

The UPDATE_RBS procedure enables you to update the resource breakdown structure header and version and delete, update, or add records to element records.

Business Rules

- UPDATE_RBS can be used to update the resource breakdown structure version, header, or elements, individually or in combination with each other.
- If P_HEADER_REC, P_VERSION_REC, and P_ELEMENTS_TBL are null then nothing is updated.
- If UPDATE_RBS is called for a nonexistent resource breakdown structure, it returns a "No Data Found" error message and stops.
- If the P_ELEMENTS_TBL is populated then the data will be processed in the following order: PROCESS_TYPE 'D,' 'U,' 'A.'
- You cannot delete the root node/element record for UPDATE_RBS because it is system-generated.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_HEADER_REC
- P_VERSION_REC
- P_ELEMENTS_TBL
- X_ELEMENTS_TBL
- X_RETURN_STATUS
- X_MSG_COUNT

- X_ERROR_MSG_DATA

INIT_RBS_PROCESSING

INIT_RBS_PROCESSING is a Load-Execute-Fetch procedure that initializes the global temporary tables for creating and updating the resource breakdown structure.

LOAD_RBS_HEADER

LOAD_RBS_HEADER is a load-execute-fetch procedure that loads header record information into the global PL/SQL record for the resource breakdown structure.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_NAME
- P_EFFECTIVE_START_DATE
- X_RETURN_STATUS

LOAD_RBS_VERSION

LOAD_RBS_VERSION is a load-execute-fetch procedure that loads version record information into a global PL/SQL record.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_NAME
- P_VERSION_START_DATE
- X_RETURN_STATUS

LOAD_RBS_ELEMENTS

LOAD_RBS_ELEMENTS is a load-execute-fetch procedure that loads element record information into a global PL/SQL table.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PARENT_ELEMENT_ID
- P_RESOURCE_TYPE_ID
- P_PROCESS_TYPE
- X_RETURN_STATUS

FETCH_RBS_HEADER

FETCH_RBS_HEADER is a load-execute-fetch procedure that retrieves the RBS_HEADER_ID and the header success or error status back to the calling procedure.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- X_RBS_HEADER_ID
- X_RETURN_STATUS

FETCH_RBS_VERSION

FETCH_RBS_VERSION is a load-execute-fetch procedure that retrieves the RBS_VERSION_ID and the version success status.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- X_RBS_VERSION_ID
- X_RBS_VER_RETURN_STATUS

- X_RETURN_STATUS

FETCH_RBS_ELEMENT

FETCH_RBS_ELEMENT is a load-execute-fetch procedure that retrieves the RBS_ELEMENT_ID and the success value for the index value you enter.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_RBS_ELEMENT_INDEX
- X_RBS_ELEMENT_ID
- X_RETURN_STATUS

EXEC_CREATE_RBS

EXEC_CREATE_RBS is a load-execute-fetch procedure that executes the resource breakdown structure creation process.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- X_RETURN_STATUS
- X_MSG_COUNT
- X_ERROR_MSG_DATA

EXEC_UPDATE_RBS

EXEC_UPDATE_RBS is a load-execute-fetch procedure that executes the resource breakdown structure update process.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- X_RETURN_STATUS
- X_MSG_COUNT
- X_ERROR_MSG_DATA

FREEZE_RBS_VERSION

FREEZE_RBS_VERSION is a process that freezes the current working resource breakdown structure version and enables the user to create a new working version.

Business Rules

- To freeze a working resource breakdown structure version, you must pass one or more of the following parameters
  - RBS_VERSION_ID
  - RBS_HEADER_ID
  - RBS_HEADER_NAME

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_RBS_VERSION_ID
- P_RBS_VERSION_RECORD_VER_NUM
- X_RETURN_STATUS
- X_MSG_COUNT
- X_ERROR_MSG_DATA

ASSIGN_RBS_TO_PROJECT

ASSIGN_RBS_TO_PROJECT is a process that assigns the resource breakdown structure to a project. You must provide the resource breakdown structure Header ID and the Project ID.

Business Rules

- You must provide the resource breakdown structure and the project to which the resource breakdown structure must be associated.
- To pass project information, you can pass either of the following:
  - the project identifier from the P_PROJECT_ID field
  - the project reference from the P_PROJECT_REFERENCE field
- To pass resource breakdown structure information, you can pass either of the following:
  - the resource breakdown structure header identifier in the P_RBS_HEADER_ID field.
  - the resource breakdown structure header name in the P_RBS_HEADER_NAME field.
- You can assign a resource breakdown structure for the purpose of project reporting and/or program reporting.
- You can also indicate whether the resource breakdown structure should be the primary reporting resource breakdown structure for your project.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PROJECT_ID
- P_RBS_HEADER_ID
- X_RETURN_STATUS
- X_MSG_COUNT
- X_ERROR_MSG_DATA

Dependency APIs

Dependency API Views

The following list shows the views that provide parameter data for the dependency APIs. For detailed description of the views, refer to Oracle eTRM, which is available on Oracle*MetaLink.*

PA_STRUCT_TASKS_AMG_V Displays a list of structure versions

PA_TASKS_AMG_V Displays a list of tasks

Dependency API Procedures

The procedures discussed in this section are listed below. The procedures are located in the public API package PA_PROJECT_PUB

- CREATE_DEPENDENCY, page 3-155
- UPDATE_DEPENDENCY, page 3-156
- DELETE_DEPENDENCY, page 3-157

Dependency API Procedure Definitions

This section contains descriptions of the dependency APIs.

CREATE_DEPENDENCY

CREATE_DEPENDENCY is a PL/SQL procedure that creates an intra-project dependency.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_MSG_COUNT
- P_MSG_DATA
- P_RETURN_STATUS
- P_PM_PRODUCT_CODE

- P_PM_PROJECT_REFERENCE
- P_PA_PROJECT_ID
- P_STRUCTURE_VERSION_ID
- P_PM_TASK_REFERENCE
- P_PA_TASK_ID
- P_PM_PRED_REFERENCE
- P_PA_PRED_ID

UPDATE_DEPENDENCY

UPDATE_DEPENDENCY is a PL/SQL procedure that updates an existing intra-project dependency.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_MSG_COUNT
- P_MSG_DATA
- P_RETURN_STATUS
- P_PM_PRODUCT_CODE
- P_PM_PROJECT_REFERENCE
- P_PA_PROJECT_ID
- P_STRUCTURE_VERSION_ID
- P_PA_TASK_ID
- P_PA_PRED_ID
- P_PM_TASK_REFERENCE
- P_PM_PRED_REFERENCE
- P_PA_TASK_ID

- P_PA_PRED_ID

DELETE_DEPENDENCY

DELETE_DEPENDENCY is a PL/SQL procedure that deletes an existing intra-project dependency.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_MSG_COUNT
- P_MSG_DATA
- P_RETURN_STATUS
- P_PM_PRODUCT_CODE
- P_PM_PROJECT_REFERENCE
- P_PA_PROJECT_ID
- P_STRUCTURE_VERSION_ID
- P_PM_TASK_REFERENCE
- P_PA_TASK_ID
- P_PM_PRED_REFERENCE
- P_PA_PRED_ID

Task Assignment APIs

The task assignment APIs provide an interface for external systems to insert, update, and delete task assignments and periodic data.

Task Assignment Views

The following list shows the views that provide parameter data for the task assignment APIs. For detailed description of the views, refer to Oracle eTRM, which is available on Oracle*MetaLink.*

PA_TASK_ASSIGNMENTS_AMG_V You can use this view to retrieve valid task assignments from Oracle Projects and display them in your external

system.

Task Assignment API Procedures

The procedures discussed in this section are listed below. The procedures are located in the public API package PA_TASK_ASSIGNMENTS_PUB.

Task Assignment API Record and Table Datatype

The record and table datatypes used by the task assignment APIs are defined on the following pages.

ASSIGNMENT_IN_REC_TYPE

The following table shows the ASSIGNMENT_IN_REC_TYPE datatype.

Name	Type	Required?	Description
PM_PROJECT_REFERENCE	VARCHAR2(25)	No	External project reference
PA_PROJECT_ID	NUMBER	No	Identifier of the project

Name	Type	Required?	Description
PA_STRUCTURE_VERSION_ID	NUMBER	No	Identifier of the structure version
PM_TASK_REFERENCE	VARCHAR2(25)	No	External task reference
PA_TASK_ID	NUMBER	No	Identifier of the task
PA_TASK_ELEMENT_VERSION_ID	NUMBER	No	Identifier of the task version
PM_TASK_ASGMT_REFERENCE	VARCHAR2(30)	No	External task assignment reference
PA_TASK_ASSIGNMENT_ID	NUMBER	No	Identifier of the task assignment
RESOURCE_ALIAS	VARCHAR2(80)	No	Alias of the planning resource
RESOURCE_LIST_MEMBER_ID	NUMBER	No	Identifier of the planning resource
START_DATE	DATE	No	Start date of the task assignment
END_DATE	DATE	No	End date of the task assignment
PLANNED_QUANTITY	NUMBER	No	Planned effort or quantity
PLANNED_TOTAL_RAW_COST	NUMBER	No	Planned raw cost
PLANNED_TOTAL_BUR_COST	NUMBER	No	Planned burdened cost
CURRENCY_CODE	VARCHAR2(30)	No	Currency code
ATTRIBUTE_CATEGORY	VARCHAR2(30)	No	Descriptive Flexfield attribute
ATTRIBUTE1 - ATTRIBUTE30	VARCHAR2(150)	No	Descriptive Flexfield attribute
DESCRIPTION	VARCHAR2(240)	No	Description of the assignment. This parameter can only be used on update.
USE_TASK_SCHEDULE_FLAG	VARCHAR2(1)	No	Flag indicating whether the assignment dates are the same as the task scheduled dates. This parameter can only be used on update.

Name	Type	Required?	Description
RAW_COST_RATE_OVERRIDE	NUMBER	No	Override raw cost rate. This parameter can only be used on update.
BURD_COST_RATE_OVERRIDE	NUMBER	No	Override burdened cost rate. This parameter can only be used on update.
BILLABLE_WORK_PERCENT	NUMBER	No	Billable percent. This parameter can only be used on update.
MFG_COST_TYPE	VARCHAR2(10)	No	Manufacturing cost type. This parameter can only be used on update.
MFG_COST_TYPE_ID	NUMBER	No	Identifier of the manufacturing cost type. This parameter can only be used on update.
P_CONTEXT_FLAG	VARCHAR2(1)	No	Flag indicating whether the task assignments that are not passed on the tasks should be deleted.
SCHEDULED_DELAY	NUMBER	No	The assignment scheduled delay

ASSIGNMENT_OUT_REC_TYPE

The following table shows the ASSIGNMENT_OUT_REC_TYPE datatype.

Name	Type	Required?	Description
PA_TASK_ID	NUMBER	Yes	Identifier of the task
PA_TASK_ASSIGNMENT_ID	NUMBER	Yes	Identifier of the task assignment
RESOURCE_ALIAS	VARCHAR2(80)	Yes	Alias of the planning resource
RESOURCE_LIST_MEMBER_ID	NUMBER	Yes	Identifier of the planning resource
RETURN_STATUS	VARCHAR2(1)	Yes	Returned status

TASK_DEL_REC_TYPE

The following table shows the TASK_DEL_REC_TYPE datatype.

Name	Type	Required?	Description
PA_TASK_ELEM_VERSION_ID	NUMBER	No	Identifier of the task version
PA_TASK_ASSIGNMENT_ID	NUMBER	No	Identifier of the task assignment
DEL_TA_FLAG	VARCHAR2(1)	No	Flag indicating whether the assignment should be deleted

TASK_ASGMT_DEL_TYPE

The following table shows the TASK_ASGMT_DEL_TYPE datatype.

Name	Type	Required?	Description
PA_TASK_ID	NUMBER	No	Identifier of the task
START_DEL_INDEX	NUMBER	No	Starting index
END_DEL_INDEX	NUMBER	No	Ending index
DEL_TA_FLAG	VARCHAR2(1)	No	Flag indicating whether to delete the assignment

ASSIGNMENT_PERIODS_TYPE

The following table shows the ASSIGNMENTS_PERIODS_TYPE datatype.

Name	Type	Required?	Description
PM_PRODUCT_CODE	VARCHAR2(30)	No	Product code
PM_PROJECT_REFERENCE	VARCHAR2(25)	No	External project reference
PA_PROJECT_ID	NUMBER	No	Identifier of the project

Name	Type	Required?	Description
PA_STRUCTURE_VERSION_ID	NUMBER	No	Identifier of the structure version
PM_TASK_REFERENCE	VARCHAR2(25)	No	External task reference
PA_TASK_ID	NUMBER	No	Identifier of the project task
PA_TASK_ELEMENT_VERSION_ID	NUMBER	No	Identifier of the task version
PM_TASK_ASGMT_REFERENCE	VARCHAR2(25)	No	External task assignment reference
PA_TASK_ASSIGNMENT_ID	NUMBER	No	Identifier of the task assignment
RESOURCE_ALIAS	VARCHAR2(80)	No	Alias of the planning resource
RESOURCE_LIST_MEMBER_ID	NUMBER	No	Identifier of the planning resource
PERIOD_NAME	VARCHAR2(30)	No	Name of the period
START_DATE	DATE	No	Starting date of the period
END_DATE	DATE	No	Ending date of the period
QUANTITY	NUMBER	No	Planned effort ot quantity for the period
TXN_RAW_COST	NUMBER	No	Planned raw cost for the period
TXN_BURDENED_COST	NUMBER	No	Planned burdened cost for the period
TXN_CURRENCY_CODE	VARCHAR2(30)	No	Currency code

Task Assignment API Procedure Definitions

This section contains description of the task assignments APIs, including business rules and parameters.

LOAD_TASK_ASSIGNMENTS

LOAD_TASK_ASSIGNMENTS is a PL/SQL procedure that moves task assignments from client side to a PLSQL table on the server side, where it is used by LOAD/EXECUTE/FETCH cycle.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- X_RETURN_STATUS
- X_MSG_COUNT
- X_MSG_DATA

LOAD_TASK_ASSIGNMENT_PERIODS

LOAD_TASK_ASSIGNMENT_PERIODS is a PL/SQL procedure that moves the periodic data of task assignments from client side to a PLSQL table on the server side.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- X_RETURN_STATUS
- X_MSG_COUNT
- X_MSG_DATA

EXECUTE_CREATE_TASK_ASGMTS

EXECUTE_CREATE_TASK_ASGMTS is a PL/SQL procedure that creates task assignments using data in a PLSQL table.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- X_RETURN_STATUS
- X_MSG_COUNT

- X_MSG_DATA

EXECUTE_UPDATE_TASK_ASGMTS

EXECUTE_UPDATE_TASK_ASGMTS is a PL/SQL procedure that updates task assignments.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- X_RETURN_STATUS
- X_MSG_COUNT
- X_MSG_DATA

CREATE_TASK_ASSIGNMENTS

CREATE_TASK_ASSIGNMENTS is a PL/SQL procedure that creates task assignments by accepting a table of assignment records.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_TASK_ASSIGNMENTS_IN
- P_TASK_ASSIGNMENTS_OUT
- X_RETURN_STATUS
- X_MSG_COUNT
- X_MSG_DATA

CREATE_TASK_ASSIGNMENT_PERIODS

CREATE_TASK_ASSIGNMENT_PERIODS is a PL/SQL procedure that creates task assignments and periodic data by accepting a table of assignment records and a table of periodic data.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_TASK_ASSIGNMENTS_IN
- P_TASK_ASSIGNMENTS_OUT
- P_TASK_ASSIGNMENT_PERIODS_IN
- P_TASK_ASSIGNMENT_PERIODS_OUT
- X_RETURN_STATUS
- X_MSG_COUNT
- X_MSG_DATA

UPDATE_TASK_ASSIGNMENTS

UPDATE_TASK_ASSIGNMENTS is a PL/SQL procedure that updates task assignments. This API allows users to update the resource assignments on tasks without locking the workplan version, and allows multiple users to update the resource assignments for a task.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_TASK_ASSIGNMENTS_IN
- P_TASK_ASSIGNMENTS_OUT
- X_RETURN_STATUS
- X_MSG_COUNT
- X_MSG_DATA

UPDATE_TASK_ASSIGNMENT_PERIODS

UPDATE_TASK_ASSIGNMENT_PERIODS is a PL/SQL procedure that updates task assignments and periodic data.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_TASK_ASSIGNMENTS_IN
- P_TASK_ASSIGNMENTS_OUT
- P_TASK_ASSIGNMENT_PERIODS_IN
- P_TASK_ASSIGNMENT_PERIODS_OU
- X_RETURN_STATUS
- X_MSG_COUNT
- X_MSG_DATA

DELETE_TASK_ASSIGNMENTS

DELETES_TASK_ASSIGNMENTS is a PL/SQL procedure that deletes task assignments.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_TASK_ASSIGNMENTS_IN
- X_RETURN_STATUS
- X_MSG_COUNT
- X_MSG_DATA

FETCH_TASK_ASSIGNMENTS

FETCH_TASK_ASSIGNMENTS is a PL/SQL procedure that retrieves task assignments from the server side PLSQL table.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_PM_TASK_ASGMT_REFERENCE
- P_PA_TASK_ASSIGNMENT_ID
- P_PM_TASK_REFERENCE

- P_PA_TASK_ID
- P_RESOURCE_ALIAS
- P_RESOURCE_LIST_MEMBER_ID
- X_RETURN_STATUS

CONVERT_PM_TAREF_TO_ID

CONVERT_PM_TAREF_TO_ID is a PL/SQL procedure that converts a given task assignment reference to a task assignment ID.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_PM_PRODUCT_CODE
- P_PA_PROJECT_ID
- P_PA_STRUCTURE_VERSION_ID
- P_PA_TASK_ID
- P_PA_TASK_ELEM_VER_ID
- X_PA_TASK_ASSIGNMENT_ID
- X_RETURN_STATUS

INIT_TASK_ASSIGNMENTS

INIT_TASK_ASSIGNMENTS initializes the task assignments global tables prior to Load-Execute cycle.

INIT_TASK_ASSIGNMENTS has no parameters.

4

Oracle Project Costing APIs

This chapter describes how to implement APIs that interface and assign assets from external systems.

This chapter covers the following topics:

- Asset APIs
- Asset API Procedure and Function Definitions
- Cost Plus Application Programming Interface (API)

Asset APIs

The asset APIs provide an open interface for external systems to insert, update, assign, and delete assets.

Asset API Views

The following list shows the views that provide parameter data for the asset APIs. For detailed description of the views, refer to Oracle eTRM, which is available on Oracle *MetaLink.*

PA_PROJECT_ASSET_TYPE_LOV_V — You can use this view to retrieve valid project asset types from Oracle Projects and display them in your external system.

PA_ASSET_BOOKS_LOV_V — You can use this view to retrieve valid asset books from Oracle Projects and display them in your external system.

PA_PARENT_ASSET_LOV_V — You can use this view to retrieve valid parent assets from Oracle Projects and display them in your external system.

PA_RET_TARGET_ASSET_LOV_V — You can use this view to retrieve valid retired target assets from Oracle Projects and display them in your external system.

PA_PROJECT_ASSETS_AMG_V	You can use this view to retrieve valid project assets from Oracle Projects and display them in your external system.

Asset API Procedures and Functions

The procedures and functions discussed in this section are listed below. The procedures and functions are located in the public API package PA_PROJECT_ASSETS_PUB.

- ADD_PROJECT_ASSET, page 4-2
- UPDATE_PROJECT_ASSET, page 4-3
- DELETE_PROJECT_ASSET, page 4-4
- ADD_ASSET_ASSIGNMENT, page 4-4
- DELETE_ASSET_ASSIGNMENT, page 4-4
- LOAD_PROJECT_ASSET, page 4-5
- LOAD_ASSET_ASSIGNMENT, page 4-5
- EXECUTE_ADD_PROJECT_ASSET, page 4-6
- CONVERT_PM_ASSTREF_TO_ID, page 4-7
- FETCH_PROJECT_ASSET_ID, page 4-7

Asset API Procedure and Function Definitions

This section contains detailed description of the asset APIs.

ADD_PROJECT_ASSET

This procedure adds a project asset to the specified project If the validations complete successfully, a new PA_PROJECT_ASSETS_ALL row is created.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PM_PROJECT_REFERENCE

- P_PA_PROJECT_ID
- P_PM_ASSET_REFERENCE
- P_PA_ASSET_NAME
- P_ASSET_NUMBER
- P_ASSET_DESCRIPTION
- P_PROJECT_ASSET_TYPE

UPDATE_PROJECT_ASSET

This procedure updates a project asset on the specified project. If the validations complete successfully, the PA_PROJECT_ASSETS_ALL row is updated with any new values specified.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_MSG_COUNT
- P_MSG_DATA
- P_RETURN_STATUS
- P_PM_PRODUCT_CODE
- P_PM_PROJECT_REFERENCE
- P_PA_PROJECT_ID
- P_PA_ASSET_NAME
- P_ASSET_NUMBER
- P_ASSET_DESCRIPTION
- P_PROJECT_ASSET_TYPE

DELETE_PROJECT_ASSET

This procedure deletes a project asset and any associated asset assignments from a project.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameter for this procedure is listed below:

- P_API_VERSION_NUMBER

ADD_ASSET_ASSIGNMENT

This procedure adds an asset assignment to the specified project. If the validations complete successfully, a PA_PROJECT_ASSET_ASSIGNMENTS row is created.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_MSG_COUNT
- P_MSG_DATA
- P_RETURN_STATUS
- P_PM_PRODUCT_CODE
- P_PM_PROJECT_REFERENCE
- P_PA_PROJECT_ID
- P_PM_TASK_REFERENCE

DELETE_ASSET_ASSIGNMENT

This procedure deletes an asset assignment from a project.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_MSG_COUNT
- P_MSG_DATA
- P_RETURN_STATUS
- P_PM_PRODUCT_CODE
- P_PM_PROJECT_REFERENCE
- P_PA_PROJECT_ID
- P_PM_TASK_REFERENCE

LOAD_PROJECT_ASSET

This procedure adds a project asset row to the global PL/SQL table G_ASSETS_IN_TBL. If the asset already exists on the project, the procedure calls the UPDATE_PROJECT_ASSET procedure.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_ASSET_REFERENCE
- P_PA_ASSET_NAME
- P_ASSET_NUMBER
- P_ASSET_DESCRIPTION
- P_PROJECT_ASSET_TYPE

LOAD_ASSET_ASSIGNMENT

This procedure adds an asset assignment row to the global PL/SQL table G_ASSET_ASSIGNMENTS_IN_TBL. Rows in this table can then be added in mass to the current project by the EXECUTE_ADD_PROJECT_ASSET procedure, which calls the ADD_ASSET_ASSIGNMENT procedure for each row in the PL/SQL table.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of

this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_RETURN_STATUS
- P_PM_TASK_REFERENCE

EXECUTE_ADD_PROJECT_ASSET

This procedure is called from the CREATE_PROJECT procedure. It processes project assets and project asset assignments sent to the procedure in PL/SQL table input parameters.

For each project asset row in the P_ASSETS_IN table, the procedure determines if the asset already exists. If it exists, the procedure calls the UPDATE_PROJECT_ASSET procedure for that row. Otherwise, it calls the ADD_PROJECT_ASSET procedure for that row.

For each project asset assignment row in the P_ASSET_ASSIGNMENTS_IN table, the procedure determines if the asset assignment already exists. If the assignment does not exist, the procedure calls the ADD_ASSET_ASSIGNMENT procedure for that row. If it does exist, the procedure does nothing.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_MSG_COUNT
- P_MSG_DATA
- P_RETURN_STATUS
- P_PM_PRODUCT_CODE
- P_PM_PROJECT_REFERENCE
- P_PA_PROJECT_ID
- P_ASSETS_IN

CONVERT_PM_ASSETREF_TO_ID

This procedure converts an incoming asset reference to a project asset ID.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_PA_PROJECT_ID
- P_RETURN_STATUS

FETCH_PROJECT_ASSET_ID

This function returns the PROJECT_ASSET_ID based on the ASSET_REFERENCE and PROJECT_ID.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_PA_PROJECT_ID
- P_PM_ASSET_REFERENCE

Cost Plus Application Programming Interface (API)

Oracle Projects provides a procedure you can use to call the Cost Plus Application Programming Interface. This procedure retrieves an amount based on your burden cost setup. You can specify the burden schedule, effective date, expenditure type, and organization to retrieve the burden cost amount based on the criteria you specify.

For example, you can use this procedure to derive the raw cost amount of a related transaction using a specific burden schedule of rates and the project organization as inputs.

> **Note:** Any amounts calculated using the API will not show up in cost plus detail views that display the burden cost breakdown. Also, if you update rates for the burden schedule, you must manually mark all items that are affected by the rate changes.

Get Burden Amount

The cost plus application programming interface procedure is *PA_COST_PLUS.GET_BURDEN_AMOUNT*.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Error Handling

Use the status and stage parameters to help resolve error conditions should your procedure fail.

The status parameter indicates the processing status of your procedure as follows:

status = 0 The procedure executed successfully.

status < 0 An Oracle error occurred and the process did not complete.

> **Tip:** Ensure that you are returning the status of the cost plus procedure to the procedure that you are calling the cost plus API from to help resolve error conditions.

status > 0 See stage parameter.

The stage parameter shows you where in the processing of the cost plus API the procedure failed. Use the stage parameter to resolve the specific problem that caused your procedure to fail. The following table lists these different stages and what they mean.

Stage	Meaning
100	Cannot find a revision for the given burden schedule and effective date
200	Cannot find the burden structure
300	Expenditure type is not in a cost base in the burden structure
400	There is no active compiled set for the given burden schedule and organization
500	There is no compiled multiplier for the given qualification

Related Topics

Labor Transaction Extensions, page 9-16

Example of Using the Cost Plus API

This section gives an example of how to use the API to calculate the burden amount according to a specific business requirement.

The business requirement is to determine the burden amount based on the following criteria.

- Burden Schedule: CP burden schedule (burden schedule ID: 60)
- Effective Date: 03-MAR-94
- Expenditure Type: Professional
- Organization: Data Systems (Organization ID: 18)
- Raw Amount: 1,000

You would use the following PL/SQL procedure to obtain the burden amount for this business requirement using the cost plus API.

```
pa_cost_plus.get_burden_amount(60,
'03-MAR-94',
'Professional',
18,
1000,
burden_amount,
burden_sch_rev_id,
compiled_set_id,
status,
stage);
if (status = 0) then
-- use the calculated burden_amount to implement your
-- business requirement
end if;
```

5

Oracle Project Billing APIs

This chapter describes how to implement APIs for:

- Agreements and funding
- Events

This chapter covers the following topics:

- Agreement and Funding APIs
- Agreement and Funding API Procedure Definitions
- Using Agreement and Funding APIs
- Creating an Agreement Using Load-Execute-Fetch APIs
- Creating an Agreement Using a Composite Datatype API
- Event APIs
- Event API Procedure Definitions

Agreement and Funding APIs

The agreement and funding APIs provide an open interface for external systems to insert, update, and delete agreements, as well as allocate funds from one agreement to any number of projects or top-level tasks.

Security for Agreement and Funding APIs

Actions performed using the APIs are subject to data level security (Control Actions). However, no function security is enforced. To maintain the same level of security as Oracle Projects, the APIs can only be executed through Oracle Applications. This enables you to log in to the database, choose a valid responsibility, and only access the APIs that the responsibility allows.

These APIs provide the ability to copy components from the agreements and funding

form to create and maintain agreements and fundings.

Control Actions

The following new Control Actions have been added for Agreement/Funding API functionality:

- Update Agreement
- Delete Agreement
- Add Funding
- Update Funding
- Delete Funding

For more information on the control actions, see Control Actions Window, *Oracle Projects User Guide*.

Agreement and Funding API Views

The following table lists the views that provide parameter data for the agreement and funding APIs. For detailed description of the views, refer to Oracle eTRM, which is available on Oracle*MetaLink*.

View	Description
PA_AGREEMENT_TYPE_LOV_V	Retrieves valid agreement types
PA_TERMS_LOV_V	Retrieves customer terms
PA_OWNED_BY_LOV_V	Retrieves valid employees
PA_CUSTOMERS_LOV_V	Retrieves valid customer names and numbers

Agreement and Funding API Procedures

The procedures discussed in this section are listed below. The procedures are located in the public API package PA_AGREEMENT_PUB.

- CREATE_AGREEMENT, page 5-3
- DELETE_AGREEMENT, page 5-4

Agreement and Funding API Procedure Definitions

This section contains description of the agreement and funding APIs, including business rules and parameters.

CREATE_AGREEMENT

This API creates an agreement with associated funds.

> **Note:** To use this API you must have a database environment that is capable of supporting the PL/SQL table and a user defined record (for example, Oracle Server 7.3 and PL/SQL 2.3). Otherwise,use the Load-Execute-Fetch APIs supplied in the pa_agreement_pub_ package.

Business Rules

List of values

- Customer number
- Agreement type
- Agreement number
- Term name
- Revenue limit
- Valid Employee

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_AGREEMENT_IN_REC

DELETE_AGREEMENT

This API deletes an agreement and associated funds.

Business Rules

- If the funding is baselined, the agreement cannot be deleted.
- Check accrued or billed amount:

  agreement amount >= total funding amount >=0

  AND

  total funding amount >= amount accrued or billed

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

- P_PM_PRODUCT_CODE
- P_PM_AGREEMENT_REFERENCE
- P_AGREEMENT_ID

UPDATE_AGREEMENT

This API updates an agreement and associated funds.

Business Rules

- If there is at least one summary project funding that exists where the sum of the baselined amount and total unbaselined amount is less then the revenue accrued or billed amount, the API does not allow the revenue or invoice limit to be changed.
- The agreement amount cannot be less than the sum of the total baselined amount and unbaselined amount.
- The customer cannot be changed if there is one fund for the agreement.
- List of Values
  - Customer number
  - Agreement type
  - Agreement number
  - Term name
  - Revenue limit
  - Valid employee

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_MSG_COUNT
- P_MSG_DATA
- P_RETURN_STATUS

- P_PM_PRODUCT_CODE
- P_AGREEMENT_IN_REC

CREATE_BASELINE_BUDGET

The API procedure PA_AGREEMENT_PUB.CREATE_BASELINE_BUDGET creates and baselines an approved revenue budget and baselines the funding for a project. This procedure calls the PA_BUDGET_PUB.CREATE_DRAFT_BUDGET procedure to create a budget and the PA_BUDGET.BASELINE_BUDGET procedure to baseline the budget.

Business Rules:

- Baseline Funding without Budget must be enabled for the project. The functionality can be enabled for a project in the Revenue and Billing Information window.
- If funding for the project is at the project level, the procedure creates an approved revenue budget that uses the system-defined budget entry method Project Level Baseline. This budget entry method budgets at the project level and does not use a resource list.
- If funding for the project is at the top task level, the procedure creates an approved revenue budget that uses the system-defined budget entry method Task Level Baseline. This budget entry method budgets at the top task level and does not use a resource list.
- The currency of the budget is the project functional currency.
- If descriptive flexfields are defined for a budget, you can pass them in as parameters.
- All the business rules associated with the Budget APIs are enforced.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_MSG_COUNT
- P_MSG_DATA
- P_RETURN_STATUS
- P_PM_PRODUCT_CODE

- P_PA_PROJECT_ID

ADD_FUNDING

This API adds funding to an agreement.

Business Rules

- If the project is funded by multiple customers, funding cannot be done at the task level.
- If the project is funded by one customer, multiple agreements generate an error message.
- If the Project Type is not Contract, the fund amount must be zero.
- If the funding is baselined, the funding amount cannot be updated.
- If the project's invoice processing currency is defined as funding currency, the project cannot be funded by more than one currency.
- Check funding level: If there is an existing Project Level Funding, there cannot also be a Top Task Level Funding. A project can only have one funding level.
- Check accrued or billed amount:

  agreement amount >= total funding amount >=0

  AND

  total funding amount >= amount accrued or billed

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PM_FUNDING_REFERENCE
- P_FUNDING_ID
- P_PA_PROJECT_ID
- P_AGREEMENT_ID

- P_ALLOCATED_AMOUNT

DELETE_FUNDING

This API deletes a fund from an agreement.

Business Rules

- If the funding is baselined, the agreement cannot be deleted.
- Check accrued or billed amount:

  agreement amount >= total funding amount >=0

  AND

  total funding amount >= amount accrued or billed

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PM_FUNDING_REFERENCE
- P_FUNDING_ID

UPDATE_FUNDING

This API updates funding for an agreement.

Business Rules

- If the project is funded by multiple customers, task level funding is not allowed.
- If the project is funded by one customer, multiple agreements generate an error message.
- If the Project Type is not Contract, the fund amount must be zero.
- If the funding is baselined, the funding amount cannot be updated.
- If the project's invoice processing currency is defined as funding currency, the project cannot be funded by more than one currency.

- Check funding level: If there is an existing Project Level Funding, there cannot also be a Top Task Level Funding. A project can only have one funding level.
- Check accrued or billed amount:

  agreement amount >= total funding amount >=0

  AND

  total funding amount >= amount accrued or billed

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PM_FUNDING_REFERENCE
- P_FUNDING_ID
- P_AGREEMENT_ID

INIT_AGREEMENT

This API sets the global tables used by the Load-Execute-Fetch procedures that create a new agreement or update an existing agreement.

Parameters: None

LOAD_AGREEMENT

This API loads an agreement to a PL/SQL record.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_AGREEMENT_REFERENCE
- P_AGREEMENT_ID
- P_CUSTOMER_ID

- P_CUSTOMER_NAME
- P_CUSTOMER_NUM
- P_AGREEMENT_NUM
- P_AGREEMENT_TYPE
- P_AMOUNT
- P_TERM_ID
- P_TERM_NAME
- P_OWNED_BY_PERSON_ID
- P_OWNED_BY_PERSON_NAME

LOAD_FUNDING

This API loads funding to a PL/SQL table.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_FUNDING_REFERENCE
- P_FUNDING_ID
- P_AGREEMENT_ID
- P_PROJECT_ID
- P_ALLOCATED_AMOUNT

EXECUTE_CREATE_AGREEMENT

This API creates an agreement with the funding using the data stored in the global tables during the Load phase.

Business Rules

List of values

- Customer number
- Agreement type
- Agreement number
- Term name
- Revenue limit
- Valid Employee

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_AGREEMENT_ID_OUT
- P_CUSTOMER_ID_OUT

EXECUTE_UPDATE_AGREEMENT

This API updates an agreement with the funding using the data stored in the global tables during the Load phase.

Business Rules

- If there is at least one summary project funding that exists where the sum of the baselined amount and total unbaselined amount is less then the revenue accrued or billed amount, the API does not allow the revenue or invoice limit to be changed.
- The agreement amount cannot be less than the sum of the total baselined amount and unbaselined amount.
- The customer cannot be changed if there is one fund for the agreement.
- List of Values
  - Customer number
  - Agreement type

- Agreement number
- Term name
- Revenue limit
- Valid employee

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

FETCH_FUNDING

This API gets the return_status that was returned during creation of funds and stored in a global PL/SQL table.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_FUNDING_INDEX

CLEAR_AGREEMENT

This API clears the global variables that were set up during initialization.

CHECK_DELETE_AGREEMENT_OK

This API checks whether an agreement can be deleted.

Business Rules

- If the funding is baselined, the agreement cannot be deleted.
- Check accrued or billed amount:

  agreement amount >= total funding amount >=0

AND

total funding amount >= amount accrued or billed

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_AGREEMENT_REFERENCE
- P_AGREEMENT_ID

CHECK_ADD_FUNDING_OK

This API checks whether a fund can be added.

Business Rules

- If the project is funded by multiple customers, task level funding is not allowed.
- If the project is funded by one customer, multiple agreements generate an error message.
- If the project's invoice processing currency is defined as funding currency, the project cannot be funded by more than one currency.
- If the project type is not Contract, the fund amount must be zero.
- If the funding is baselined, the funding amount cannot be updated.
- The funding level must be valid: If there is an existing Project Level Funding, there cannot also be a Top Task Level Funding. A project can only have one funding level.
- The accrued/billed amount must be valid:

  agreement amount >= total funding amount >=0

  AND

  total funding amount >= amount accrued or billed

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_AGREEMENT_REFERENCE
- P_AGREEMENT_ID
- P_PM_FUNDING_REFERENCE
- P_TASK_ID
- P_PROJECT_ID

CHECK_DELETE_FUNDING_OK

This API checks whether a fund can be deleted.

Business Rules

- If the funding is baselined, the agreement cannot be deleted.
- Check accrued or billed amount:

  agreement amount >= total funding amount >=0

  AND

  total funding amount >= amount accrued or billed

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_FUNDING_REFERENCE
- P_FUNDING_ID

CHECK_UPDATE_FUNDING_OK

This API checks whether a fund can be added.

Business Rules

- If the project is funded by multiple customers, task level funding is not allowed.
- If the project type is not Contract, the fund amount must be zero.

- If the funding is baselined, the funding amount cannot be updated.
- If the project's invoice processing currency is defined as funding currency, the project cannot be funded by more than one currency.
- Funding level checks
  - If there is no task ID , there can be no task level funding.
  - If there is a task ID, there can be no project level funding.
- Check accrued/billed amount
  - agreement amount >= total funding amount >=0 AND
  - total funding amount >= amount accrued or billed

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PM_FUNDING_REFERENCE
- P_FUNDING_ID
- P_PM_AGREEMENT_REFERENCE
- P_AGREEMENT_ID

Using Agreement and Funding APIs

The following example describes how to create an interface between Oracle Projects and the agreement and funding information entered in your system. Depending on your company's business needs, your implementation of the project APIs may be more or less complex than the scenario shown here. As you work through the example, you may want to refer to information elsewhere in the manual.

- For a detailed description of agreement and funding APIs, see Agreement and Funding APIs., page 5-1
- Most of the Oracle Projects APIs use a standard set of input and output parameters. For a description of these parameters, see Standard API Parameters, page 2-21.

- For an example of PL/SQL code for creating a project without using composite datatypes, see Creating a Project Using the Load-Execute-Fetch APIs, page 3-60.

Step 1: Connect to an Oracle Database

To ensure that proper security is enforced while accessing Oracle Projects data, follow the steps in Security Requirements, page 2-8.

Step 2: Collect Agreement Information

Collect the following information to create an agreement in Oracle Projects:

- Agreement reference- Unique identifier of the Agreement.
- Customer- Valid customer in Oracle Projects.
- Agreement Type- Valid agreement type in Oracle Projects.
- Agreement Terms- Valid agreement terms in Oracle Projects.
- Owner of the agreement- Valid employee in Oracle Projects.

You can also use the following views to retrieve the list of values for collecting agreement information:

- PA_AGREEMENT_TYPE_LOV_V
- PA_TERMS_LOV_V
- PA_OWNED_BY_LOV_V
- PA_CUSTOMERS_LOV_V

Step 3: Interface Agreement Information to the Server

Not all tools can call the APIs that use composite datatypes. Tools that do not support composite datatypes must call the supplementary Load -Execute -Fetch APIs. The Load-Execute-Fetch APIs include procedures to initialize, load, execute, fetch, and clear data.

Use these APIs only if you use a tool that does not support composite data type parameters. If the tool (for example, Oracle PL/SQL Version 2.3 or higher) supports composite data type parameters, you can call the CREATE_AGREEMENT and ADD_FUNDING APIs directly. Following is the flow of the Load-Execute-Fetch Agreement and Funding procedures:

- Initialize Agreement (INIT_AGREEMENT)

- Load Agreement (LOAD_AGREEMENT)
- Load Funding (LOAD_FUNCING)
- Execute Create Agreement (EXECUTE_CREATE_AGREEMENT)
- Fetch Funding (Fetch Funding)
- Clear Agreement (CLEAR_AGREEMENT)

In the example above, INIT_AGREEMENT resets the server-side global PL/SQL tables that temporarily store the Agreement and Funding data. Once you set up these tables, you can use LOAD_AGREEMENT to move the Agreement data to the Oracle Projects database.

When you create a new agreement, this procedure must also pass parameters: P_PM_AGREEMENT_REFERENCE the unique reference code that identifies the agreement in the external system.

Step 4: Interface Funding Information to the Server

After you interface the agreement-related data to the server, call LOAD_FUNDING to interface with the funding-related data to the server-side global PL/SQL tables. Call LOAD_FUNDING once for each funding in the agreement.

> **Important:** Each funding must specify at least the following information:

- Funding Reference (P_PM_FUNDING_REFERENCE): The unique reference code that identifies the funding in the external system.
- Agreement ID (P_AGREEMENT_ID): The identifier of the agreement for which the funding needs to be created.
- Project ID (P_PROJECT_ID): The identifier of the Project for which the funding needs to be created.
- Task ID (P_TASK_ID): For task-level funding, the identifier of the task for which the funding needs to be created.

Step 5: Start the Server-Side Process

After the Load procedures have successfully moved the agreement and funding data to the Oracle Projects global PL/SQL tables, call up the EXECUTE_CREATE_AGREEMENT procedure to process the agreement and funding data that you interfaced to the global PL/SQL tables. In addition to the standard input and output parameters, this Execute procedure requires the following parameters:

Input parameters

- P_PM_PRODUCT_CODE - The identification code of the product exporting the agreement . For information about setting up your product (external system) as a source, refer to Setting Up Your Product in Oracle Projects.

Output parameters

- P_AGREEMENT_ID - The unique Oracle Projects identification code for the new Agreement.
- P_CUSTOMER_ID - The unique Oracle Projects customer id with which the agreement was created.

Step 6: Get Return Values for Fundings

After the Load and Execute procedures create your agreement and funding in Oracle Projects, use FETCH_FUNDING to return each unique funding identification code from Oracle Projects.

The key input parameter for this procedure is P_FUNDING_INDEX, which points to a single funding,and the output parameters are P_FUNDING_ID and P_PM_FUNDING_REFERENCE.

To call the procedure for each funding, you can write a simple program to call FETCH_FUNDING in a loop with P_FUNDING_INDEX as the stepping variable (1 through the total number of funding). The output parameter P_RETURN_STATUS indicates whether the API handled the specific funding successfully (S). If the parameter returns E or U, the funding caused an error, and you must stop the Fetch procedure to retrieve the related error message. Fetch APIs do not return error message data. Instead, use GET_MESSAGES to retrieve the error text, as described in the next step.

Step 7: Retrieve Error Messages

Every Oracle Projects API includes two standard output parameters:

- P_RETURN_STATUS - indicates whether the API was executed successfully
- P_MSG_COUNT shows the number of errors detected during the execution of the API

If the API detects one error, the API returns the error message text. If the API detects multiple errors, use GET_MESSAGES to retrieve the error messages. See GET_MESSAGES, page 2-25.

Step 8: Finish the Load-Execute-Fetch Process

After executing the Fetch procedures and retrieving any error messages, finish the

Load-Execute-Fetch process by calling the API CLEAR_AGREEMENT and either save or roll back your changes to the database.

Creating an Agreement Using Load-Execute-Fetch APIs

The following sample PL/SQL code is a script that creates an agreement using the Load-Execute-Fetch APIs. The Load-Execute-Fetch APIs use parameters with standard datatypes (VARCHAR2, NUMBER, and DATE). These APIs do not use composite datatypes.

To create agreements using tools or products that support composite datatypes, see Creating an Agreement Using a Composite Datatype API, page 5-24.

```
DECLARE
--API standard parameters
l_api_version_number NUMBER :=1.0;
l_commit VARCHAR2(1):='T';
l_return_status VARCHAR2(1)
l_init_msg_list VARCHAR2(1)
l_msg_count NUMBER;
l_msg_data VARCHAR2(2000);
l_data VARCHAR2(2000);
l_msg_entity VARCHAR2(100);
l_msg_entity_index NUMBER;
l_msg_index NUMBER;
l_msg_index_out NUMBER;
l_encoded VARCHAR2(1)
l_agreement_id_out NUMBER;
l_customer_id_out NUMBER;
l_funding_id NUMBER;
--Oracle agreement specific variable
l_pm_product_code VARCHAR2(25);
l_agreement_in_rec pa_agreement_pub.Agreement_Rec_In_Type;
l_agreement_out_rec pa_agreement_pub.Agreement_Rec_Out_Type;

--Oracle funding specific parameters
l_funding_type pa_agreement_pub.funding_rec_in_type;
l_funding_in_tbl pa_agreement_pub.funding_in_tbl_type;
l_funding_out_tbl pa_agreement_pub.funding_out_tbl_type;
--Local agreement parameters
l_early_start_date DATE;
l_pm_agreement_reference VARCHAR2(25);
l_agreement_id NUMBER;
l_customer_id NUMBER;
l_customer_name VARCHAR2(25);
l_customer_num VARCHAR2(25);
l_agreement_num VARCHAR2(25);
l_agreement_type VARCHAR2(25);
l_amount NUMBER;
l_term_id NUMBER;
l_term_name VARCHAR2(25);
l_revenue_limit_flag VARCHAR2(25);
l_expiration_date DATE;
l_description VARCHAR2(25);
l_owned_by_person_id NUMBER;
l_owned_by_person_name VARCHAR2(25);
l_attribute_category VARCHAR2(25);
l_attribute1 VARCHAR2(25);
l_attribute2 VARCHAR2(25);
l_attribute3 VARCHAR2(25);
l_attribute4 VARCHAR2(25);
l_attribute5 VARCHAR2(25);
l_attribute6 VARCHAR2(25);
l_attribute7 VARCHAR2(25);
l_attribute8 VARCHAR2(25);
l_attribute9 VARCHAR2(25);
l_attribute10 VARCHAR2(25);
l_template_flag VARCHAR2(25);

--local funding variables
l_pm_funding_reference VARCHAR2(25);
l_funding_rec pa_agreement_pub.funding_rec_in_type;
l_funding_in pa_agreement_pub.funding_in_tbl_type;
--loop variables
```

```
a NUMBER:=0;
API_ERROR EXCEPTION;
BEGIN
-- PRODUCT RELATED DATA
l_pm_product_code :='MSPROJECT';
-- AGREEMENT RELATED DATA
l_pm_agreement-reference :='amg06';
l_agreement_id :=Null;
l_customer_id :=1004;
l_customer_name :='Universal Packaging';
l_customer_num :='1004';
l_agreement_num :='amg06';
l_agreement_type :='Service Agreement';
l_amount := 2000;
l_term_id := 4;
l_term_name := Null;
l_revenue_limit_flag := N;
l_expiration_date := Null;
l_description := Null;
l_owned_by_person_id := 53;
l_owned-by_person_name :=Null;
l_attribute_category :=Null;
l_attribute1 :=Null;
l_attribute2 :=Null;
l_attribute3 :=Null;
l_attribute4 :=Null;
l_attribute5 :=Null;
l_attribute6 :=Null;
l_attribute7 :=Null;
l_attribute8 :=Null;
l_attribute9 :=Null;
l_attribute10 :=Null;
l_template_flag :=N;

--FUNDING RELATED DATA
a:= 1
l_funding_rec.pm_funding_reference := 'amg06fun';
l_funding_rec.project_funding_id = Null;
l_funding_rec.agreement_id := Null;
l_funding_rec.project_id := 15353;
l_funding_rec.task_id := Null;
l_funding_rec.allocated_amount := 1000;
l_funding_rec.date_allocated := '01-JAN-2000';
l_funding_rec.attribute_category := Null;
l_funding_rec.attribute1 := Null;
l_funding_rec.attribute2 := Null;
l_funding_rec.attribute3 := Null;
l_funding_rec.attribute4 := Null;
l_funding_rec.attribute5 := Null;
l_funding_rec.attribute6 := Null;
l_funding_rec.attribute7 := Null;
l_funding_rec.attribute8 := Null;
l_funding_rec.attribute9 := Null;
l_funding_rec.attribute10 := Null;

-- LOOP CONSTRUCT
l_funding_in(a):= l_funding_rec;
a:= 2;
l_funding_rec.pm_funding_reference := 'C1004';
l_funding_rec.project_funding_id :=Null;
l_funding_rec.agreement_id := Null;
```

```
l_funding_rec.project_id := 1404;
l_funding_rec.task_id := Null;
l_funding_rec.allocated_amount := 1000;
l_funding_rec.date_allocated := '01-JAN-2000';
l_funding_rec.attribute_category := Null;
l_funding_rec.attribute1 := Null;
l_funding_rec.attribute2 := Null;
l_funding_rec.attribute3 := Null;
l_funding_rec.attribute4 := Null;
l_funding_rec.attribute5 := Null;
l_funding_rec.attribute6 := Null;
l_funding_rec.attribute7 := Null;
l_funding_rec.attribute8 := Null;
l_funding_rec.attribute9 := Null;
l_funding_rec.attribute10 := Null;

-- LOOP CONSTRUCT
l_funding_in(a) := l_funding_rec;
-----------------------------------------
--INIT_CREATE_AGREEMENT
pa_agreement_pub.init_agreement;
-----------------------------------------
--LOAD AGREEMENT
pa_agreement_pub.load_agreement
(p_api_version_number => l_api_version_number
,p_init_msg_list => l_init_msg_list
,p_return_status => l_return_status
,p_pm_agreement_reference =>
l_pm_agreement_reference
,p_agreement_id => l_agreement_id
,p_customer_id => l_customer_id
,p_customer_name => l_customer_name
p_customer_num => l_customer_num
,p_agreement_num => l_agreement_num
,p_agreement_type => l_agreement_type
,p_amount => l_amount
,p_term_id => l_term_id
,p_term_name => l_term_name
,p_revenue_limit_flag => l_revenue_limit_flag
,p_expiration_date => l_expiration_date
,p_description => l_description
,p_owned_by_person_id => l_owned_by_person_id
,p_owned_by_person_name => l_owned_by_person_name
,p_attribute_category => l_attribute_category
,p_attribute1 => l_attribute1
,p_attribute2 => l_attribute2
,p_attribute3 => l_attribute3
,p_attribute4 => l_attribute4
,p_attribute5 => l_attribute5
,p_attribute6 => l_attribute6
,P_attribute7 => l_attribute7
,p_attribute8 => l_attribute8
,p_attribute9 => l_attribute9
,p_attribute10 => l_attribute10
,p_template_flag => l_template_flag);
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;

-- LOAD_FUNDING (loop for multiple Fundings )
```

```
FOR i IN 1..a LOOP
pa_agreement_pub.load_funding
(p_api_version_number => l_api_version_number
,p_init_msg_list => l_init_msg_list
,p_return_status => l_return_status
,p_pm_funding_reference => l_funding_in(i).pm_funding_reference
,p_funding_id => l_funding_in(i).project_funding_id
,p_agreement_id => l_funding_in(i).agreement_id
,p_project_id => l_funding_in(i).project_id
,p_task_id => l_funding_in(i).task_id
,p_allocated_amount => l_funding_in(i).allocated_amount
,p_date_allocated => l_funding_in(i).date_allocated
,p_attribute_category => l_funding_in(i).attribute_category
,p_attribute1 => l_funding_in(i).attribute1
,p_attribute2 => l_funding_in(i).attribute2
,p_attribute3 => l_funding_in(i).attribute3
,p_attribute4 => l_funding_in(i).attribute4
,p_attribute5 => l_funding_in(i).attribute5
,p_attribute6 => l_funding_in(i).attribute6
,p_attribute7 => l_funding_in(i).attribute7
,p_attribute8 => l_funding_in(i).attribute8
,p_attribute9 => l_funding_in(i).attribute9
,p_attribute10 => l_funding_in(i).attribute10);

IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
END LOOP;
--EXECUTE_CREATE_AGREEMENT
pa_agreement_pub.execute_create_agreement
( p_api_version_number => l_api_version_number,
p_commit => l_commit,
p_init_msg_list => l_init_msg_list,
p_msg_count => l_msg_count,
p_msg_data => l_msg_data
p_return_status => l_return_status,
p_pm_product_code => l_pm_product_code,
p_agreement_id_out => l_agreement_id_out,
p_customer_id_out => l_customer_id_out);

IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;

--FETCH_TASK
FOR l_funding_index in 1 ..a (loop for multiple Fundings)
LOOP
pa_agreement_pub.fetch_funding
(p_api_version_number => l_api_version_number
,p_init_msg_list => l_init_msg_list
,p_return_status => l_return_status
,p_funding_index => l_funding_index
,p_funding_id => l_funding_id
,p_pm_funding_reference =>
l_pm_funding_reference);
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
```

```
END LOOP;

-----------------------------------------
CLEAR_CREATE_AGREEMENT
pa_agreement_pub.clear_agreement;
-----------------------------------------
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;

-- HANDLE EXCEPTIONS
EXCEPTION
WHEN API_ERROR THEN
for i in 1..l_msg_count
loop
pa_interface_utils_pub.get_messages
(p_msg_data => l_msg_data,
p_data => l_data,
p_msg_count => l_msg_count,
p_msg_index_out =>
l_msg_index_out);
dbms_output.put_line ('error mesg '||l_data);
end loop;

WHEN OTHERS THEN
for i in 1..l_msg_count
loop
pa_interface_utils_pub.get_messages
(p_msg_data => l_msg_data,
p_data => l_data,
p_msg_count => l_msg_count,
p_msg_index_out => l_msg_index_out);
dbms_output.put_line ('error mesg '||l_data),
end loop;
END ;
```

Creating an Agreement Using a Composite Datatype API

The following sample PL/SQL code is a script that creates an agreement using the PA_AGREEMENT_PUB.CREATE_AGREEMENT, which uses composite datatypes.

If you create budgets using tools or products that do not support composite datatypes, see Creating an Agreement Using the Load-Execute-Fetch APIs, page 5-19.

```
DECLARE
--variables needed for API standard parameters
l_api_version_number NUMBER :=1.0;
l_commit VARCHAR2(1):= 'F';
l_return_status VARCHAR2(1);
l_init_msg_list VARCHAR2(1);
l_msg_count NUMBER;
l_msg_data VARCHAR2(2000);
l_data VARCHAR2(2000);
l_msg_entity VARCHAR2(100);
l_msg_entity_index NUMBER;
l_msg_index NUMBER;
l_msg_index_out NUMBER;
l_encoded VARCHAR2(1);
l_agreement_id_out NUMBER;
l_customer_id-outNUMBER;
l_funding_id NUMBER;

--variables needed for Oracle Agreement specific
parameters
l_pm_product_codeVARCHAR2(25);
p_agreement_in_rec pa_agreement_pub.Agreement_Rec._In_type
p_agreement_out_rec pa_agreement_pub.Agreement_Rec_Out_type

--variables needed for funding specific parameters
l_funding_type pa_agreement_pub.funding_rec_in_type;
l_agreement_in_rec pa_agreement_pub.funding_in_tbl_type;
l_funding_out_tblpa_agreement_pub.funding_out_tbl_type;

--Funding Variables
l_pm_funding_reference VARCHAR2(25);
l_funding_rec pa_agreement_pub.funding_rec_in_type;
l_funding_in pa_agreement_pub.funding_rec_in_type;
l_funding_out pa_agreement_pub.funding_rec_out_type;

-- Loop Variables;
a NUMBER
API_ERROR EXCEPTION

--BEGIN
-- PRODUCT RELATED DATA
l_pm_product_code:='MSPROJECT';

--AGREEMENT DATA
p_agreement_in_rec.pm_agreement_reference := 'AMGTEST1';
p_agreement_in_rec.agreement_id := Null;
p_agreement_in_rec.customer_id := 21491;
p_agreement_in_rec.customer_num := '1086';
p_agreement_in_rec.agreement_num := 'AMGTEST1';
p_agreement_in_rec.agreement_type := 'Contract';
p_agreement_in_rec.amount := 2000;
p_agreement_in_rec.term_id := 1000;
p_agreement_in_rec.term_name := Null;
p_agreement_in_rec.revenue_limit_flag:= 'N';
p_agreement_in_rec.expiration_date := Null;
p_agreement_in_rec.description := Null;
p_agreement_in_rec.owned_by_person_id:= 1234;
p_agreement_in_rec.attribute_category:= Null;
p_agreement_in_rec.attribute1 := Null;
p_agreement_in_rec.attribute3 := Null;
p_agreement_in_rec.attribute4 := Null;
```

```
p_agreement_in_rec.attribute5 := Null;
p_agreement_in_rec.attribute6 := Null;
p_agreement_in_rec.attribute7 := Null;
p_agreement_in_rec.attribute8 := Null;
p_agreement_in_rec.attribute9 := Null;
p_agreement_in_rec.attribute10 := Null;
p_agreement_in_rec.template_flag := 'N';

--FUNDING DATA
a:= 1;
l_funding_rec.pm_funding_reference := 'AMGTEST1FUN'
l_funding_rec.project_funding_id := Null;
l_funding_rec.agreement_id := Null;
l_funding_rec.project_id := 7946;
l_funding_rec.task_id := 10273;
l_funding_rec.allocated_amount := 200;
l_funding_rec.date_allocated := '27-DEC-01';
l_funding_rec.desc_flex_name := Null;
l_funding_rec.attribute_category := Null;
l_funding_rec.attribute1 := Null;
l_funding_rec.attribute2 := Null;
l_funding_rec.attribute3 := Null;
l_funding_rec.attribute4 := Null;
l_funding_rec.attribute5 := Null;
l_funding_rec.attribute6 := Null;
l_funding_rec.attribute7 := Null;
l_funding_rec.attribute8 := Null;
l_funding_rec.attribute9 := Null;
l_funding_rec.attribute10 := Null;
-- LOOP CONSTRUCT
l_funding_in(a):= l_funding_rec;
-- CONSTRUCTING THE FUNDING TABLE
FOR i IN 1..a LOOP
l_funding_in(i).pm_funding_reference :=
l_funding_rec.pm_funding_reference
l_funding_in(i).project_funding_id :=l_funding_rec.funding _id;
l_funding_in(i).agreement_id :=l_funding_rec.p_agreement_id;
l_funding_in(i).project_id :=l_funding_rec._project_id;
l_funding_in(i).task_id := l_funding_rec.p_task_id;
l_funding_in(i).allocated_amount :=l_funding_rec.p_allocated_amount;
l_funding_in(i).date_allocated :=l_funding_rec.p_date_allocated;
l_funding_in(i).desc_flex_name :=l_funding_rec.p_desc_flex_name;
l_funding_in(i).attribute_category :=l_funding_rec.p_attribute_category;
l_funding_in(i).attribute1 :=l_funding_rec.p_attribute1;
l_funding_in(i).attribute2 :=l_funding_rec.p_attribute2;
l_funding_in(i).attribute3 :=l_funding_rec.p_attribute3;
l_funding_in(i).attribute4 :=l_funding_rec.p_attribute4;
l_funding_in(i).attribute5 :=l_funding_rec.p_attribute5;
l_funding_in(i).attribute6 :=l_funding_rec.p_attribute6;
l_funding_in(i).attribute7 :=l_funding_rec.p_attribute7;
l_funding_in(i).attribute8 :=l_funding_rec.p_attribute8;
l_funding_in(i).attribute9 :=l_funding_rec.p_attribute9;
l_funding_in(i).attribute10 :=l_funding_rec.p_attribute10;
END LOOP;

-- 'CREATE_AGREEMENT
pa_agreement_pub.create_agreement
( p_api_version_number => l_api_version_number
,p_commit => l_commit
,p_init_msg_list => l_init_msg_list
,p_msg_count => l_msg_count
```

```
,p_msg_data => l_msg_data
,p_return_status => l_return_status
,p_pm_product_code => l_pm_product_code
,p_agreement_in_rec => p_agreement_in_rec
,p_agreement_out_rec=> p_agreement_out_rec
,p_funding_in_tbl => l_funding_in
,p_funding_out_tbl => l_funding_out);
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;

--HANDLE EXCEPTIONS
EXCEPTION
WHEN API_ERROR THEN
for i in 1..1_msg_count
loop
pa_interface_utils_pub.get_messages
(p_msg_date => l_msg_date
,p_data => l_data
,p_msg_count => l_msg_count
,p_msg_index_out => l_msg_index_out)
dbms_output.put_line ('error mesg' 1_data)
end loop;
if i = 1 THEN
WHEN OTHERS THEN
pa_interface_utils_pub.get_messages
(p_msg_data => l_msg_data
,p_data => l_data
,p_msg_count => l_msg_count
,p_msg_index_out => l_msg_index_out);
dbms_output.put_line ('error mesg'1_data)
END;
/
```

Event APIs

The event APIs provide an open interface for external systems to insert, update, and delete events.

Event API Procedures

The procedures discussed in this section are listed below. The procedures are located in the public API package PA_EVENT_PUB.

- CREATE_EVENT, page 5-32
- DELETE_EVENT, page 5-32
- UPDATE_EVENT, page 5-32
- INIT_EVENT, page 5-33
- LOAD_EVENT, page 5-33

- EXECUTE_CREATE_EVENT, page 5-33
- EXECUTE_UPDATE_EVENT, page 5-34
- FETCH_EVENT, page 5-34
- CLEAR_EVENT, page 5-34
- CHECK_DELETE_EVENT_OK, page 5-34

Events API Record and Table Datatypes

The following PL/SQL record types and table types defined at the package specification level are used in the Events APIs. These PL/SQL record types and table types represent an array of data in the PA_EVENTS table.

EVENT_REC_IN_TYPE Datatype

The following table shows the parameters in EVENT_REC_IN_TYPE:

Name	Type	Value	Description
P_PM_EVENT _REFERENCE	VARCHAR2 (25)	NULL	Unique identifier of the event in the external system
P_TASK_NUMBER	VARCHAR2 (25)	NULL	The sequential number that identifies the task
P_EVENT_NUMBER	NUMBER	NULL	The sequential number that identifies the event
P_EVENT_TYPE	VARCHAR2 (30)	NULL	The event type that classifies the event
P_DESCRIPTION	VARCHAR2 (250)	NULL	The free text description of the event. For billing events, the description is displayed as the invoice line description.
P_BILL_HOLD_FLAG	VARCHAR2 (1)	NULL	Flag indicating that the event is held from invoicing

Name	Type	Value	Description
P_COMPLETION_DATE	DATE	NULL	The date on which the event is complete, and on or after which the event is processed for revenue accrual and/or invoicing.
P_DESC_FLEX_NAME	VARCHAR2 (240)	NULL	Descriptive flexfield name
P_ATTRIBUTE_CATEGORY	VARCHAR2 (30)	NULL	Descriptive flexfield context field
P_ATTRIBUTE1 through ATTRIBUTE 10	VARCHAR2 (150)	NULL	Descriptive flexfield segment
P_PROJECT_NUMBER	VARCHAR2 (25)	NULL	The sequential number that identifies the project
P_ORGANIZATION_NAME	VARCHAR2 (240	NULL	Name of the organization
P_INVENTORY_ORG_NAME	VARCHAR2 (240	NULL	The inventory organization associated with the event
P_INVENTORY_ITEM_ID	NUMBER	NULL	Identifier of the inventory item associated with the event
P_QUANTITY_BILLED	NUMBER	NULL	Bill quantity
P_UOM_CODE	VARCHAR2 (3)	NULL	Unit of measure
P_UNIT_PRICE	NUMBER	NULL	Contract price
P_REFERENCE1 THROUGH REFERENCE 10	VARCHAR2 (240)	NULL	Generic reference columns

Name	Type	Value	Description
P_BILL_TRANS_CURRENCY_CODE	VARCHAR2 (15)	NULL	Transaction currency code of the event
P_BILL_TRANS_BILL_AMOUNT	NUMBER	NULL	Bill amount in the event transaction
P_BILL_TRANS_REV_AMOUNT	NUMBER	NULL	Revenue amount in the event transaction
P_PROJECT_RATE_TYPE	VARCHAR2 (30)	NULL	Exchange rate type to use for conversion from bill transaction currency to project currency
P_PROJECT_RATE_DATE	DATE	NULL	Exchange rate date to use for conversion from bill transaction currency to project currency if Fixed Date rate date type is used for customer billing.
P_PROJECT_EXCHANGE_RATE	NUMBER	NULL	Exchange rate to use for conversion from bill transaction currency to project currency if User exchange rate type is used.
P_PROJFUNC_RATE_TYPE	VARCHAR2 (30)	NULL	Exchange rate type to use for conversion from bill transaction currency to project functional currency for customer billing.
P_PROJFUNC_RATE_DATE	DATE	NULL	Exchange rate date to use for conversion from bill transaction currency to project functional currency if Fixed Date rate date type is used for customer billing.
P_PROJFUNC_EXCHANGE_RATE	NUMBER	NULL	Exchange rate to use for conversion from bill transaction currency to project functional if User exchange rate type is used.
P_FUNDING_RATE_TYPE	VARCHAR2 (30)	NULL	Exchange rate type to use for conversion from bill transaction currency to funding currency for customer billing.
P_FUNDING_RATE_DATE	DATE	NULL	Exchange rate date to use for conversion from bill transaction currency to funding currency if Fixed Date rate date type is used for customer billing.

Name	Type	Value	Description
P_FUNDING_EXCHANGE_RATE	NUMBER	NULL	Exchange rate to use for conversion from bill transaction currency to project or functional currency
P_ADJUSTING_REVENUE_FLAG	VARCHAR2 (1)	NULL	Flag indicating that the event is an adjusting revenue event
P_EVENT_ID	NUMBER	NULL	Identifier of the primary key for table
P_DELIVERABLE_ID	NUMBER	NULL	Identifier of the deliverable
P_ACTION_ID	NUMBER	NULL	Identifier of the action
P_CONTEXT	VARCHAR2 (1)	NULL	Currently not used (for future development)
P_RECORD_VERSION_NUMBER	NUMBER	NULL	The login number

EVENT_REC_OUT_TYPE Datatype

The following table displays the parameters for EVENT_REC_OUT_TYPE:

Name	Type	Value	Description
P_PM_EVENT_REFERENCE	VARCHAR2(25)	NULL	Unique identifier of an event in external system
EVENT_ID	NUMBER (15)	NULL	The reference code that uniquely identifies the event in Oracle Projects
RETURN_STATUS	VARCHAR2(1)	NULL	API standard

EVENT_IN_TBL_TYPE

EVENT_IN_TBL_TYPE is the table of EVENT_REC_IN_TYPE.

EVENT_OUT_TBL_TYPE

EVENT_OUT_TBL_TYPE is the table of EVENT_REC_OUT_TYPE.

Event API Procedure Definitions

This section contains detailed description of the event APIs.

CREATE_EVENT

This API creates an event or a set of events.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

DELETE_EVENT

This API deletes an event.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_EVENT_REFERENCE
- P_EVENT_ID

UPDATE_EVENT

This API updates an event or set of events.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

- P_MSG_COUNT
- P_MSG_DATA
- P_RETURN_STATUS

INIT_EVENT

This API sets the global tables used by the Load-Execute-Fetch procedures that create a new event or update an existing event. This API has no parameters.

LOAD_EVENT

This API loads an event to a PL/SQL record.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_PM_PRODUCT_CODE
- P_API_VERSION_NUMBER
- P_PM_EVENT_REFERENCE
- P_TASK_NUMBER
- P_EVENT_NUMBER
- P_EVENT_TYPE

EXECUTE_CREATE_EVENT

This API creates an event using the data which is stored in the global tables during the Load phase.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_EVENT_ID_OUT

EXECUTE_UPDATE_EVENT

This API updates event data using the information stored in the global tables during the Load phase.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameter for this procedure is listed below:

- P_API_VERSION_NUMBER

FETCH_EVENT

This API gets the RETURN_STATUS that was returned during creation of an event and stored in a global PL/SQL table.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

CLEAR_EVENT

This API clears the global variables that were set up during initialization.

Parameters: None

CHECK_DELETE_EVENT_OK

This API checks whether an event can be deleted.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PM_EVENT_REFERENCE

- P_EVENT_ID

6

Oracle Project Management APIs

This chapter describes how to implement Oracle Project Management APIs.

This chapter covers the following topics:

- Project Deliverables APIs
- Budget APIs
- Budget Record and Table Datatypes
- Budget API Procedure Definitions
- Using Budget APIs
- Creating a Budget Using the Load-Execute-Fetch APIs
- Creating a Budget Using a Composite Datatype API
- Refresh Planning Amounts API
- Status APIs
- Record and Table Datatypes
- Required Parameters and Parameter Values
- Status API Procedure Definitions
- Custom Summarization Reporting APIs
- Project Performance Reporting APIs

Project Deliverables APIs

The APIs for project deliverables provide an interface for external systems to create, update, and delete deliverables for a project. They also include APIs that enable you to create or delete deliverable associations to tasks and task assignments.

Project Deliverables API Views

The following table lists the views that provide parameter data for the project deliverables APIs. For detailed description of the views, refer to Oracle eTRM, which is available on *OracleMetaLink*.

View	Description
PA_DELIVERABLES_AMG_V	The list of deliverables for a project
PA_DLVR_ACTIONS_AMG_V	The list of deliverable actions for a project
PA_DELIVERABLE_TYPES_AMG_V	The list of deliverable types
PA_DELIVERABLE_STATUSES_AMG_V	The list of valid deliverable statuses
PA_ACTION_FUNCTIONS_AMG_V	The list of action functions

Project Deliverables API Procedures

The API procedures provided for project deliverables are listed below. These procedures are located in the public API package PA_PROJECT_PUB.

- ASSOCIATE_DLV_TO_TASK_ASSIGN, page 6-6
- DELETE_DLV_TO_TASK_ASSCN, page 6-7
- DELETE_DLV_TO_TASK_ASSIGN, page 6-7

You can view descriptions of all of the parameters for thes procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

LOAD_DELIVERABLE

You can use this API to load the PL/SQL table for one deliverable. The required parameters for this procedure are listed below:

- X_RETURN_STATUS
- P_DELIVERABLE_NAME
- P_DELIVERABLE_SHORT_NAME
- PX_DELIVERABLE_ID
- P_PM_DELIVERABLE_REFERENCE

LOAD_DELIVERABLES

You can use this API to load the PL/SQL table for deliverables. The required parameters for this procedure are listed below:

- X_RETURN_STATUS
- P_DELIVERABLE_NAME
- P_DELIVERABLE_SHORT_NAME
- PX_DELIVERABLE_ID
- P_PM_DELIVERABLE_REFERENCE

LOAD_ACTION

You can use this procedure to load a single deliverable action in the PL/SQL table for deliverable actions. The required parameters for this procedure are listed below:

- P_DELIVERABLE_ID

LOAD_ACTIONS

You can use this procedure to load the PL/SQL table for deliverable actions. The required parameters for this procedure are listed below:

- P_DELIVERABLE_ID

Business Rules

- The parameters P_EXPENDITURE_ORG_ID, P_EXPENDITURE_TYPE, and P_EXPENDITURE_ITEM_DATE are required only if the destination type is EXPENSE.
- The parameter P_RECEIVING_ORG_ID is required only for non-item-based deliverables.
- A value is required for the parameter P_RECEIVING_ORG only for deliverables that are not of the type class *item*.
- The parameters P_QUANTITY and P_UOM_CODE are required only for non-item deliverable procurement type. These parameters are applicable for the action *Shipping*.
- The parameter P_SHIP_FROM_ORGANIZATION_ID is required only for Shipping actions for deliverables that are not of the type class *item*.

CREATE_DELIVERABLE

You can use this procedure to create a deliverable for a project. The required parameters for this procedure are listed below:

- X_RETURN_STATUS
- P_DELIVERABLE_NAME
- P_DELIVERABLE_SHORT_NAME
- PX_DELIVERABLE_ID
- P_PM_DELIVERABLE_REFERENCE

UPDATE_DELIVERABLE

You can use this procedure to update the attributes of a deliverable. The required parameters for this procedure are listed below:

- X_RETURN_STATUS

- PX_DELIVERABLE_ID
- P_PM_DELIVERABLE_REFERENCE

CREATE_DELIVERABLE_ACTION

You can use this procedure to create a deliverable action for a deliverable. The required parameters for this procedure are listed below:

- P_DELIVERABLE_ID

Business Rules

- If the class type of the deliverable is *item*, the following rules apply:
  - If the action is Procurement, values are required for P_RECEIVING_ORG_ID and P_QUANTITY.
  - If the action is Shipping, values are required for P_SHIP_FROM_ORGANIZATION_ID.
- If the destination type is EXPENSE, the following parameters are required:
  - P_EXPENDITURE_TYP
  - P_EXPENDITURE_ITEM_DATE
- If the deliverable class type is not *item*, the following rules apply:
  - The parameter P_RECEIVING_ORG_ID is required.
  - If the action is Procurement or Shipping, P_QUANTITY and P_UOM are required.
  - If the action is Shipipng, P_SHIP_FROM_ORGANIZATION_ID is required.

UPDATE_DELIVERABLE_ACTION

You can use this procedure to update attributes of a deliverable action. The required parameters for this procedure are listed below:

- P_DELIVERABLE_ID

Business Rules

- If the class type of the deliverable is *item*, the following rules apply:
  - If the action is Procurement, values are required for P_RECEIVING_ORG_ID

and P_QUANTITY.

- If the action is Shipping, values are required for P_SHIP_FROM_ORGANIZATION_ID.

- If the destination type is EXPENSE, the following parameters are required:
  - P_EXPENDITURE_TYP
  - P_EXPENDITURE_ITEM_DATE

- If the deliverable class type is not *item*, the following rules apply:
  - The parameter P_RECEIVING_ORG_ID is required.
  - If the action is Procurement or Shipping, P_QUANTITY and P_UOM are required.
  - If the action is Shipipng, P_SHIP_FROM_ORGANIZATION_ID is required.

DELETE_DELIVERABLES

You can use this procedure to delete a deliverable for a project.

DELETE_DELIVERABLE_ACTIONS

You can use this procedure to delete a deliverable action for a deliverable. The required parameters for this procedure are listed below:

- P_PM_DELIVERABLE_REFERENCE
- P_DELIVERABLE_ID
- P_ACTION_ID

ASSOCIATE_DLV_TO_TASK

You can use this procedure to associate a deliverable with a task. The required parameters for this procedure are listed below:

- P_DELIVERABLE_REFERENCE
- P_DELIVERABLE_ID

ASSOCIATE_DLV_TO_TASK_ASSIGN

You can use this procedure to associate a deliverable to a task assignment. The required parameters for this procedure are listed below:

- P_DELIVERABLE_ID

DELETE_DLV_TO_TASK_ASSCN

You can use this procedure to delete a deliverable-to-task association. The required parameters for this procedure are listed below:

- P_PM_DELIVERABLE_REFERENCE
- P_DELIVERABLE_ID

DELETE_DLV_TO_TASK_ASSIGN

You can use this procedure to delete a deliverable-to-task assignment association. The required parameters for this procedure are listed below:

- P_DELIVERABLE_ID
- P_PM_DELIVERABLE_REFERENCE

Budget APIs

Budgets track the time and resources that you expect to use to complete a project or task. Use your external system to prepare your budget, and then use Budget APIs to interface the budget and budget line into Oracle Projects. Oracle Projects then generates a budget based on the resource budgets and rates stored in the external system. You can interface multiple budget versions to Oracle Projects and baseline them as needed.

> **Note:** When youcall a budget API that requires a project identifier, you must pass either the P_PA_PROJECT_ID or the P_PM_PROJECT_REFERENCE parameter to identify the project. When youcall a budget API that requires a resource list identifier, you must pass either the P_RESOURCE_LIST_NAME or the P_RESOURCE_LIST_ID parameter to identify the resource list.

Budget API Views

The following list shows the views that provide parameter data for the budget APIs. For detailed description of the views, refer to Oracle eTRM, which is available on Oracle *MetaLink.*

View	Description
PA_BASE_BUDGET_BY_GL_PERIOD_V	Most recent baselined budget amounts by GL period
PA_BASE_BUDGET_BY_PA_PERIOD_V	Most recent baselined budget amounts by PA period
PA_BUDGET_CHANGE_REASON_V	Retrieves budget change reason codes
PA_BUDGET_ENTRY_METHODS_V	Retrieves budget entry methods
PA_BUDGET_STATUS_CODES_V	Retrieves budget status codes
PA_BUDGET_TYPES_V	Retrieves budget types
PA_ORIG_BUDGET_BY_GL_PERIOD_V	Original budget amounts by GL period.
PA_ORIG_BUDGET_BY_PA_PERIOD_V	Original budget amounts by PA period
PA_FINPLAN_TYPES_V	Retrieves financial plan types
PA_BASE_FINPLAN_BY_GL_PERIOD_V	Most recent budget baseline amounts by GL period for financial plan types
PA_BASE_FINPLAN_BY_PA_PERIOD_V	Most recent budget baseline amounts by PA period for financial plan types
PA_ORIG_ FINPLAN_BY_GL_PERIOD_V	Original budget amounts by GL period for financial plan types
PA_ORIG_ FINPLAN_BY_PA_PERIOD_V	Original budget amounts by PA period for financial plan types

Budget API Procedures

The procedures discussed in this section are listed below. The procedures are located in the public API package PA_BUDGET_PUB.

- Budget and Budget Line Procedures
  - ADD_BUDGET_LINE, page 6-16
  - BASELINE_BUDGET, page 6-20

- CALCULATE_AMOUNTS, page 6-21
- CREATE_DRAFT_BUDGET, page 6-24
- CREATE_DRAFT _FINPLAN, page 6-27
- DELETE_BUDGET_LINE, page 6-33
- DELETE_DRAFT_BUDGET, page 6-37
- GET_PROJECT_ID, page 6-39
- SET_PROJECT_ID, page 6-39
- UPDATE_BUDGET, page 6-39
- UPDATE_BUDGET_LINE, page 6-47

- Load-Execute-Fetch Procedures
  - CLEAR_BUDGET, page 6-52
  - CLEAR_CALCULATE_AMOUNTS, page 6-52
  - EXECUTE_CALCULATE_AMOUNTS, page 6-52
  - EXECUTE_CREATE_DRAFT_BUDGET, page 6-53
  - EXECUTE_CREATE_DRAFT_FINPLAN, page 6-54
  - EXECUTE_UPDATE_BUDGET, page 6-54
  - FETCH_BUDGET_LINE, page 6-55
  - FETCH_CALCULATE_AMOUNTS, page 6-55
  - INIT_BUDGET, page 6-55
  - INIT_CALCULATE_AMOUNTS, page 6-55
  - LOAD_BUDGET_LINE, page 6-55
  - LOAD_RESOURCE_INFO, page 6-56

Budget Record and Table Datatypes

The record and table datatypes used in the APIs are defined on the following pages.

BUDGET_LINE_IN_TBL_TYPE Datatype

The table type BUDGET_LINE_IN_TBL_TYPE is a table of BUDGET_LINE_IN_REC_TYPE. The following table shows the attributes of the BUDGET_LINE_IN_REC_TYPE datatype.

Name	Usage	Type	Req?	Description
PA_TASK_ID	IN	NUMBER	No	The reference code that uniquely identifies the task in Oracle Projects
PM_TASK_REFERENCE	IN	VARCHAR2 (30)	No	The reference code that uniquely identifies the task in the external system
RESOURCE_ALIAS	IN	VARCHAR2 (80)	No	The alias of a resource
RESOURCE_LIST_MEMBER_ID	IN	NUMBER	No	The identification code of the resource
BUDGET_START_DATE	IN	DATE	No	Start date of budget line
BUDGET_END_DATE	IN	DATE	No	End date of budget line
PERIOD_NAME	IN	VARCHAR2 (30)	No	GL or PA period name
DESCRIPTION	IN	VARCHAR2 (255)	No	(currently unavailable)
RAW_COST	IN	NUMBER	No	Budgeted raw cost amount
BURDENED_COST	IN	NUMBER	No	Budgeted burdened cost amount
REVENUE	IN	NUMBER	No	Budgeted revenue amount

Name	Usage	Type	Req?	Description
QUANTITY	IN	NUMBER	No	Budgeted quantity
PM_PRODUCT_CODE	IN	VARCHAR2 (30)	No	The product code of the vendor of the external system
PM_BUDGET_LINE_REFERENCE	IN	VARCHAR2 (30)	No	The reference code that identifies the budget line on client side
ATTRIBUTE_CATEGORY	IN	VARCHAR2 (30)	No	Used by descriptive flexfields
ATTRIBUTE1 through ATTRIBUTE15	IN	VARCHAR2 (150)	No	Budget line descriptive flexfield
TXN_CURRENCY_CODE	IN	VARCHAR2 (15)	Yes	The transaction currency code for the budget line
PROJFUNC_COST_RATE_TYPE	IN	VARCHAR2 (30)	No	The rate type for converting cost amounts from the transaction currency to the project functional currency
PROJFUNC_COST_RATE_DATE_TYPE	IN	VARCHAR2 (30)	No	The rate date type for converting cost amounts from transaction currency to project functional currency
PROJFUNC_COST_RATE_DATE	IN	DATE	No	The rate date for converting cost amounts from transaction currency to project functional currency
PROJFUNC_COST_EXCHANGE_RATE	IN	NUMBER	No	The rate for converting cost amounts from the transaction currency to the project functional currency when the PROJFUNC_COST_RATE_TYPE is User

Name	Usage	Type	Req?	Description
PROJFUNC_REV_RATE_TYPE	IN	VARCHAR2 (30)	No	The rate type for converting revenue amounts from the transaction currency to the project functional currency
PROJFUNC_REV_RATE_DATE_TYPE	IN	VARCHAR2 (30)	No	The rate date type for converting revenue amounts from transaction currency to project functional currency
PROJFUNC_REV_RATE_DATE	IN	DATE	No	The rate date for converting revenue amounts from transaction currency to project functional currency
PROJFUNC_REV_EXCHANGE_RATE	IN	NUMBER	No	The rate for converting revenue amounts from the transaction currency to the project functional currency when the PROJFUNC_REV_RATE_TYPE is User
PROJECT_COST_RATE_TYPE	IN	VARCHAR2 (30)	No	The rate type for converting cost amounts from the transaction currency to the project currency
PROJECT_COST_RATE_DATE_TYPE	IN	VARCHAR2 (30)	No	The rate date type for converting cost amounts from transaction currency to project currency
PROJECT_COST_RATE_DATE	IN	DATE	No	The rate date for converting cost amounts from transaction currency to project currency
PROJECT_COST_EXCHANGE_RATE	IN	NUMBER	No	The rate for converting cost amounts from the transaction currency to the project currency when the PROJECT_COST_RATE_TYPE is User
PROJECT_REV_RATE_TYPE	IN	VARCHAR2 (30)	No	The rate type for converting revenue amounts from the transaction currency to the project currency
PROJECT_REV_RATE_DATE_TYPE	IN	VARCHAR2 (30)	No	The rate date type for converting revenue amounts from transaction currency to project currency

Name	Usage	Type	Req?	Description
PROJECT_REV_RATE_DATE	IN	DATE	No	The rate date for converting revenue amounts from transaction currency to project currency
PROJECT_REV_EXCHANGE_RATE	IN	NUMBER	No	The rate for converting revenue amounts from the transaction currency to the project currency when the PROJECT_REV_RATE_TYPE is User
CHANGE_REASON_CODE	IN	VARCHAR2 (30)	No	The reference code that identifies the change reason

BUDGET_LINE_OUT_TBL_TYPE Datatype

The table type BUDGET_LINE_OUT_TBL_TYPE is a table of BUDGET_LINE_OUT_REC_TYPE. The following table shows the attributes of the BUDGET_LINE_OUT_REC_TYPE datatype.

Name	Usage	Type	Req?	Description
RETURN_STATUS	OUT NOCOPY	VARCHAR2(1)		Return status

CALC_BUDGET_LINE_OUT_TBL_TYPE Datatype

The table type CALC_BUDGET_LINE_OUT_TBL_TYPE is a table of CALC_BUDGET_LINE_OUT_REC_TYPE. The following table shows the attributes of the CALC_BUDGET_LINE_OUT_REC_TYPE datatype.

Name	Usage	Type	Description
PA_TASK_ID	OUT NOCOPY	NUMBER	The reference code that uniquely identifies the task in Oracle Projects

Name	Usage	Type	Description
PM_TASK_REFERENCE	OUT NOCOPY	VARCHAR2 (30)	The reference code that uniquely identifies the task in the external system
RESOURCE_ALIAS	OUT NOCOPY	VARCHAR2 (80)	Alias of a resource
RESOURCE_LIST_MEMBER_ID	OUT NOCOPY	NUMBER	The identification code of the resource
BUDGET_START_DATE	OUT NOCOPY	DATE	Start date of a budget
BUDGET_END_DATE	OUT NOCOPY	DATE	End date of a budget
PERIOD_NAME	OUT NOCOPY	VARCHAR2 (30)	PA or GL period name
CALCULATED_RAW_COST	OUT NOCOPY	NUMBER	Calculated raw cost in transaction currency (P_TXN_CURRENCY_CODE)
CALCULATED_BURDENED_COST	OUT NOCOPY	NUMBER	Calculated burdened cost in transaction currency (P_TXN_CURRENCY_CODE)
CALCULATED_REVENUE	OUT NOCOPY	NUMBER	Calculated revenue in transaction currency (P_TXN_CURRENCY_CODE)

Name	Usage	Type	Description
QUANTITY	OUT NOCOPY	NUMBER	Quantity
RETURN_STATUS	OUT NOCOPY	VARCHAR2(1)	API standard
TXN_CURRENCY_CODE	OUT	VARCHAR2(30)	The transaction currency code for the budget line. For Forms-based budgets, this is always the project functional currency.
PROJECT_RAW_COST	OUT	NUMBER	Calculated raw cost amount in project currency. Applicable only for budgets created using the web-based user interface.
PROJECT_BURDENED_COST	OUT	NUMBER	Calculated burdened cost amount in project currency. Applicable only for budgets created using the web-based user interface.
PROJECT_REVENUE	OUT	NUMBER	Calculated revenue amount in project currency. Applicable only for budgets created using the web-based user interface.
PROJFUNC_RAW_COST	OUT	NUMBER	Calculated raw cost amount in project functional currency. Applicable only for budgets created using the web-based user interface.
PROJFUNC_BURDENED_COST	OUT	NUMBER	Calculated burdened cost in project functional currency. Applicable only for budgets created using the web-based user interface.amount
PROJFUNC_REVENUE	OUT	NUMBER	Calculated revenue amount in project functional currency. Applicable only for budgets created using the web-based user interface.

Budget API Procedure Definitions

This section contains description of the budget APIs, including business rules and parameters.

ADD_BUDGET_LINE

ADD_BUDGET_LINE is a PL/SQL procedure used to add a line to a draft or working version in Oracle Projects for either a project and budget type, or a project and financial plan type.

Business Rules

This section describes general business rules, and rules for using this procedure with versions created for budget types and for financial plan types.

General Rules

- After you use ADD_BUDGET_LINE to add a line to a draft or working version, save the data before you call the procedure BASELINE_BUDGET. (A working version may require approval before you can create a baseline.) Enter funding in Oracle Projects before you create a baseline for a revenue budget.
- You can add lines only to draft or working versions. You cannot add lines to a submitted or baseline version. You cannot add lines to an approved revenue budget working version if the autobaseline feature is enabled.
- Oracle Projects establishes the following links between information stored in your system and certain information in Oracle Projects. You can use the following parameters instead of their corresponding Oracle Projects identification codes:
  - P_PM_PROJECT_REFERENCE links to P_PA_PROJECT_ID.
  - P_FIN_PLAN_TYPE_NAME links to P_FIN_PLAN_TYPE_ID.
  - P_PM_TASK_REFERENCE links to P_PA_TASK_ID.
  - P_RESOURCE_ALIAS links to P_RESOURCE_LIST_MEMBER_ID.
- Products that call budget APIs must specify their respective product codes. Oracle Projects predefines product codes and provides these codes to the appropriate vendors.
- You do not need to specify values for the following pair of parameters if the version is not categorized by resources:
  - P_RESOURCE_ALIAS and P_RESOURCE_LIST_MEMBER_ID
- The following rules apply for versions that are time-phased by PA or GL periods:
  - If a valid value is specified for the parameter P_PERIOD_NAME, then this procedure adds a line to the version for the specified period.

If a version is time-phased by PA periods, then the value specified for the parameter P_PERIOD_NAME must map to a PA period. Likewise, if a version is time-phased by GL periods, then the value specified for P_PERIOD_NAME must map to a GL period.

If the value specified for P_PERIOD_NAME is invalid, then the procedure will abort.

- If values are specified for the parameter P_BUDGET_START_DATE and the parameter P_PERIOD_NAME, then Oracle Projects uses P_PERIOD_NAME to determine the period.

- If no value is specified for the parameter P_PERIOD_NAME, then the procedures uses the parameter P_BUDGET_START_DATE to determine the period.

  If a version is time-phased by PA periods, then the procedure selects the period based on the PA calendar. If a version is time-phased by GL periods, then the procedure selects the period based on the GL calendar.

  If Oracle Projects cannot determine a valid period name, then the procedure will abort.

- If no values are specified for the parameter P_BUDGET_START_DATE and the parameter P_PERIOD_NAME, then the procedure will abort.

- If Descriptive Flexfields are defined, then you can pass them as IN parameters.

- All business rules for adding a line to a version for a budget type or a financial plan type in the user interface are applicable when you use this procedure.

Budget Types

- The following parameters are not used for planning with budget types:
  - P_FIN_PLAN_TYPE_ID
  - P_FIN_PLAN_TYPE_NAME
  - P_VERSION_NUMBER
  - P_VERSION_TYPE
  - P_CURRENCY_CODE

- You cannot use this procedure to add a budget line for a forecast budget type.

- Specify values for the parameters P_PA_TASK_ID or P_PM_TASK_REFERENCE only when planning by tasks, as defined by the budget entry method.

- Specify values for the parameter P_PERIOD_NAME only when planning by PA or GL period, as defined by the budget entry method.
- The task level at which you specify budget information should correspond to the level specified in the budget entry method. For example, if the budget entry method specifies that you can enter a budget only at the lowest task level, then this procedure should pass only lowest tasks.
- When the budget entry method (BEM) restricts entry of a certain field as shown in the following table, do not specify values for the corresponding parameter.

BEM Setting	Related Parameter
Cost quantity not enterable	p_quantity
Raw cost not enterable	p_raw_cost
Burdened cost not enterable	p_burdened_cost
Revenue quantity not enterable	p_quantity
Revenue not enterable	p_revenue

- If a project and a budget type are enabled for budgetary controls, then you cannot add a budget line for a GL period that is after the latest encumbrance year defined in the ledger associated with the project.

Financial Plan Types

- The following parameter is not used for planning with financial plan types:
  - P_BUDGET_TYPE_CODE
- If no value is specified for the parameter P_VERSION_NUMBER, then this procedure adds the line to the current working version.
- You can specify values for the parameters P_PA_TASK_ID or P_PM_TASK_REFERENCE only when planning by tasks, as defined by the planning level of the budget or forecast.
- The task level at which you specify plan information should correspond to the level specified in the planning level of a budget or forecast version. For example, if the planning level specifies that you can enter a budget or forecast at the top task level, then this procedure should pass only top task and project-level budget and forecast

amounts.

- You cannot use this procedure to add a line under the following conditions:
  - If the option to allow edit after initial baseline is not enabled for the financial plan type, then you cannot modify a working version after you create a baseline.
  - A budget or forecast version is locked by another user or is locked for processing
  - A budget or forecast version has processing errors
  - A change document version
  - A version for an organization forecast
  - A workplan version
- When the amount entry options restrict entry of certain fields as shown in the following table, do not specify values for the corresponding parameters. In these cases, the budget or forecast is created with the specified amount entry options and edit of the corresponding quantities and amounts is not allowed.

Amount Entry Option Setting	Related Parameter
Cost quantity not enterable	p_quantity (used when the version is for cost only)
Revenue quantity not enterable	p_quantity (used when the version is for revenue only)
Quantity not enterable	p_quantity (used when cost and revenue are planned together in the same version)
Raw cost not enterable	p_raw_cost
Burdened cost not enterable	p_burdened_cost
Revenue not enterable	p_revenue

- You can specify values for the parameters P_RAW_COST and P_BURDENED_COST only for budgets or forecasts for which the financial plan type allows planning for cost, or for cost and revenue together in the same version.

- You can specify a value for the parameter P_REVENUE_AMOUNT only for a budget or forecast for which the financial plan type allows planning for revenue, or for cost and revenue together in the same version.

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

BASELINE_BUDGET

BASELINE_BUDGET is a PL/SQL procedure used to create a baseline for an existing budget in Oracle Projects for either a project and budget type, or a project and financial plan type.

Business Rules

- The following parameters are used for planning with financial plan types. These parameters are not used for planning with budget types.
  - P_FIN_PLAN_TYPE_ID
  - P_FIN_PLAN_TYPE_NAME
  - P_VERSION_TYPE
- You must set up funding in Oracle Projects before you can create a baseline for a revenue budget.
- If you have not yet submitted a budget, Oracle Projects submits it automatically before creating a baseline.
- You can submit a budget only if it contains budget lines.
- If no value (or an invalid value) is passed for the parameter P_MARK_AS_ORIGINAL, the default is N. When you create a baseline for the first time, the P_MARK_AS_ORIGINAL is set to Y.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

- P_PM_PRODUCT_CODE
- P_BUDGET_TYPE_CODE

CALCULATE_AMOUNTS

CALCULATE_AMOUNTS is a PL/SQL procedure used to recalculate raw cost, burdened cost, and revenue amounts for lines in a draft or working version in Oracle Projects for either a project and a budget type, or a project and financial plan type. This procedure uses the Budget Calculation Extension (PA_CLIENT_EXTN_BUDGET) to perform the calculations.

Business Rules

This section describes general business rules, and rules for using this procedure with versions created for budget types and for financial plan types.

General Rules

- You can recalculate amounts only for draft or working versions. You cannot recalculate amounts for submitted or baseline versions. You cannot use this procedure to recalculate amounts for an approved revenue budget version if the autobaseline feature is enabled.
- To call this procedure, you must specify the project identifier (either P_PA_PROJECT_ID or P_PM_PROJECT_REFERENCE), and one of the following budget/forecast identifiers:
  - P_BUDGET_VERSION_ID
  - BUDGET_TYPE_CODE
  - P_FIN_PLAN_TYPE_ID or P_FIN_PLAN_TYPE_NAME
- Because this procedure calls the Budget Calculation Client Extension (PA_CLIENT_EXTN_BUDGET), you must modify the extension to calculate the amounts you want.

  After this procedure calls the extension procedure CALC_RAW_COST, Oracle Projects sets quantity and rate amounts as follows:
  - For non-rate-based planning transactions, the quantity is set to the returned raw cost value. The raw cost rate remains unchanged (value equals 1), and the burdened cost rate is set to the burdened cost divided by the derived quantity.
  - For rate-based planning transactions, the raw cost rate is set to the returned raw cost value divided by the quantity.

After this procedure calls the extension procedure CALC_BURDENED_COST, Oracle Projects sets the burden cost rate to the returned burdened cost divided by the quantity.

After this procedure calls the extension procedure CALC_REVENUE, Oracle Projects sets quantity and rate amounts as follows:

- For non-rate-based planning transactions from revenue-only plans, the quantity is set to the returned revenue value.
- For non-rate based planning transactions from revenue and cost plans, the bill rate is set to the returned revenue value divided by the quantity.
- For rate-based planning transactions, the bill rate is set to the returned revenue value divided by the quantity.

- To specify amounts to recalculate, set the value of one or more of the following parameters to Y:
  - P_CALC_RAW_COST_YN
  - P_CALC_BURDENED_COST_YN
  - P_CALC_REVENUE_YN
- To automatically update version lines with recalculated amounts after the successful execution of CALCULATE_AMOUNTS, set the parameter P_UPDATE_DB_FLAG to Y.

  Regardless of the update status, CALCULATE_AMOUNTS returns one row of amounts for each line it reads. The procedure updates project currency and project functional currency amounts. Updated amounts are rolled up to the resource assignment level and version level when summarization processes are run.

Budget Types

- The following parameters are not used for planning with budget types:
  - P_FIN_PLAN_TYPE_ID
  - P_FIN_PLAN_TYPE_NAME
  - P_VERSION_TYPE
  - P_BUDGET_VERSION_NUMBER
- If a project and a budget type are enabled for budgetary controls, and the value for the parameter P_UPDATE_DB_FLAG is set to Y, then Oracle Projects does not recalculate budget lines for GL periods that are after the latest encumbrance year

defined in the ledger associated with the project.

Financial Plan Types

- The following parameter is not used for planning with financial plan types:
  - P_BUDGET_TYPE_CODE
- If no value is specified for the parameter P_BUDGET_VERSION_NUMBER, then this procedure recalculates amounts for the current working version.
- You must specify a value for the parameter P_VERSION_TYPE if cost and revenue are planned separately.
- You cannot use this procedure to recalculate amounts for a working version under the following conditions:
  - If the option to allow edit after initial baseline is not enabled for the financial plan type, then you cannot modify a working version after you create a baseline.
  - A budget or forecast version is locked by another user or is locked for processing
  - A budget or forecast version has processing errors
  - A change document version
  - A version for an organization forecast
  - A workplan version
- For forecast versions that are time-phased by periods, this procedure recalculates amounts for lines that do not have actual amounts (where the value of the parameter P_BUDGET_START_DATE is after the ETC start date). If a forecast version is not time-phased by periods, then this procedure recalculates amounts for all lines, including lines with actual amounts.
- If the Budget Calculation Extension procedures cannot calculate a value, or calculates a zero amount, then the procedure reports an error.

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_PM_PRODUCT_CODE

CREATE_DRAFT_BUDGET

CREATE_DRAFT_BUDGET is a PL/SQL procedure used to create a draft budget and its budget lines in Oracle Projects for a given project, using a selected budget type and budget entry method, or financial plan type.

This API uses composite datatypes. For more information, see APIs That Use Composite Datatypes, page 2-22.

Business Rules

- The following parameters are used for planning with financial plan types. These parameters are not used for planning with budget types.
  - Plan type identifier and plan type name parameters
  - Version type parameters
  - P_TIME_PHASED_CODE
  - P_PLAN_IN_MULTI_CURR_FLAG
  - Currency attributes
  - Flags for raw cost, burdened cost, revenue, quantity planning, create current working version, replace current working version
  - P_USING_RESOURCE_LISTS_FLAG
- A draft budget requires approval before you can create a baseline. After you use this API to create a draft budget and budget lines, save the data to the database before calling the API BASELINE_BUDGET. For a revenue budget, enter the funding in Oracle Projects before you can create a baseline.
- We establish the following links between information stored in your system and certain information in Oracle Projects, so you can pass the following parameters instead of their corresponding Oracle Projects identification codes.
  - For budgets: P_PM_PROJECT_REFERENCE links to P_PA_PROJECT_ID. P_RESOURCE_LIST_NAMElinks to P_RESOURCE_LIST_ID.
  - For budget lines P_PM_TASK_REFERENCE links to P_PA_TASK_ID. P_RESOURCE_ALIAS links to P_RESOURCE_LIST_MEMBER_ID.
- Products that call budget APIs must specify their respective product codes. Oracle Projects predefines product codes and provides these codes to the appropriate vendors.

- The following pairs of parameters can both have NULL values if the budget is not categorized by resources, as defined by the budget entry method or financial planning option:
  - P_RESOURCE_LIST_NAME and P_RESOURCE_LIST_ID
  - RESOURCE_ALIAS and RESOURCE_LIST_MEMBER_ID
- You can specify a value for the PA_TASK_ID or PM_TASK_REFERENCE parameter only when budgeting by tasks, as defined by the budget entry method or financial planning option.
- You can specify a value for the PERIOD_NAME parameter only when budgeting by PA or GL period, as defined by the budget entry method or financial planning option.
- If you budget by PA or GL period and do not provide a period name, Oracle Projects uses the budget start and end dates to select a valid period name from the database. If Oracle Projects fails to retrieve a valid period name, the API will abort.
- When you budget by date range, you must provide the budget start and end dates. These dates may not overlap for a certain resource assignment.

  Note: You cannot budget by date range for budgets that you create for financial plan types.

- The task level at which you pass budget information should correspond to the level specified in the budget entry method. For example, for budgets that you create for budget types, if the budget entry method specifies that you can enter a budget only at the lowest task level, then this API passes only lowest tasks.
- When the budget entry method (BEM) flags shown in the following table are set to N, do not pass the related parameters.

BEM Flag	Related Parameter
cost_quantity_flag	quantity
raw_cost_flag	raw_cost
burdened_cost_flag	burdened_cost
rev_quantity_flag	quantity

BEM Flag	Related Parameter
revenue_flag	revenue

- Your budget entry method must reflect the needs of your external system.
- You can specify values for the parameters P_RAW_COST and P_BURDENED_COST amounts only for a cost budget, as defined by the budget type or financial plan type.
- You can specify a value for the parameter P_REVENUE_AMOUNT only for a revenue budget, as defined by the budget type or financial plan type.
- Passing the PL/SQL table P_BUDGET_LINES_TBL is optional. A draft budget does not require you to create budget lines simultaneously.
- If a draft budget already exists for a project and budget type, creating a new draft budget deletes the existing budget and budget lines.
- If a working budget or forecast version exists for a project and financial plan type, creating a new working budget or forecast version with P_CREATE_NEW_CURR_WORKING_FLAG set to N creates a new working budget or forecast version with budget lines.
- If a current working budget or forecast version exists for a project and financial plan type, creating a new working budget or forecast version with P_CREATE_NEW_CURR_WORKING_FLAG set to Y marks the newly created budget or forecast version as Current Working.
- If a current working budget or forecast version exists for a project and financial plan type, creating a new working budget or forecast version with P_REPLACE_CURRENT_WORKING_FLAG set to Y deletes the existing Current Working budget or forecast version and budget lines, and marks the newly created budget or forecast version as Current Working.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_BUDGET_TYPE_CODE

- P_ENTRY_METHOD_CODE

CREATE_DRAFT_FINPLAN

CREATE_DRAFT_FINPLAN creates draft budgets and forecasts for financial plan types and is similar to CREATE_DRAFT_BUDGET. This procedure accepts summary data at the project, task, resource, and currency levels. For budget and forecast versions that are time-phased by PA or GL period, the API also spreads the data, including quantities and amounts, across periods based on the spread curve associated with a resource. No other edit or modification of data is performed by this procedure. The validations and function security for this procedure are similar to that for CREATE_DRAFT_BUDGET.

> **Note:** This procedure calls the Budget Calculation Client Extension. If you have enabled the Budget Calculation Client Extension, the client extension may override the following amounts generated by this API procedure:
>
> - raw cost
> - burdened cost
> - revenue
>
> For additional information on the Budget Calculation Client Extension, see: Budget Calculation Extensions, page 12-3.

Business Rules

- A draft budget requires approval before you can create a baseline. After you use this API to create a draft budget and budget lines, save the data to the database before calling the API BASELINE_BUDGET. For a revenue budget, you must enter the funding in Oracle Projects before you can create a baseline for the budget.
- We establish the following links between information stored in your system and certain information in Oracle Projects. Therefore, you can pass the following parameters instead of their corresponding Oracle Projects identification codes:
  - For budgets: P_PM_PROJECT_REFERENCE links to P_PA_PROJECT_ID. P_RESOURCE_LIST_NAME links to P_RESOURCE_LIST_ID.
  - For budget lines: P_PM_TASK_REFERENCE links to P_PA_TASK_ID. P_RESOURCE_ALIAS links to P_RESOURCE_LIST_MEMBER_ID.
- Products that call budget APIs must specify their respective product codes. Oracle Projects predefines product codes and provides these codes to the appropriate vendors.

- The following pairs of parameters can both have NULL values if the budget is not categorized by resource:
  - P_RESOURCE_LIST_NAME and P_RESOURCE_LIST_ID
  - RESOURCE_ALIAS and RESOURCE_LIST_MEMBER_ID
- If the financial plan type associated with the project specifies that cost and revenue are planned separately, then you must specify whether the budget or forecast version is to be created as a cost version or a revenue version. Otherwise, you do not need to pass the value for P_VERSION_TYPE. If passed, the value should correspond to the value defined for the financial plan type.
- You can specify whether planning in multiple currencies is enabled for the budget or forecast version using P_PLAN_IN_MULTI_CURR_FLAG. If this parameter is not passed, then the system uses the value defined for the financial plan type.
- You can specify whether the budget or forecast version is time-phased by GL or PA periods, or is non-time phased. If this parameter is not passed, then the system uses the value defined for the financial plan type.
- You can specify the planning level of the budget or forecast. If this parameter is not passed, then the system uses the value defined for the financial plan type.
- If the plan amounts created using this API are not classified using a resource list, then you must set the value of P_USING_RESOURCE_LISTS_FLAG to N.
- When the amount entry fields shown in the following table are set to N, do not pass the related parameters. In this case, the budget or forecast is created with the corresponding amount entry options and edit of these quantities and amounts is not possible.

Amount Entry Field	Related Parameter
cost_quantity_flag	quantity (used when the financial plan version is for cost only)
rev_quantity_flag	quantity (used when the financial plan version is for revenue only)
all_quantity_flag	quantity (used when cost and revenue are planned together in the same financial plan version)
raw_cost_flag	raw_cost

Amount Entry Field	Related Parameter
burdened_cost_flag	burdened_cost
revenue_flag	revenue

- You can specify values for the parameters P_RAW_COST and P_BURDENED_COST only for budgets or forecasts for which the financial plan type allows planning for cost, or planning for cost and revenue together.
- You can specify a value for the parameter P_REVENUE_AMOUNT only for a budget or forecast for which the financial plan type allows planning for revenue, or planning for cost and revenue together.
- If descriptive Flexfields are defined for a budget version, you can pass them in as parameters.
- Passing the PL/SQL table P_FINPLAN_TRANS_TAB is optional.
- If a budget or forecast is time-phased by PA or GL periods, then the budget or forecast amounts passed to this API are spread using the spread curve associated with a resource between the start and end dates specified in the P_FINPLAN_TRANS_TAB composite PL/SQL table parameter.
- You can specify a value for the PA_TASK_ID or PM_TASK_REFERENCE parameter only when budgeting by tasks, as defined by the planning level of the budget or forecast.
- The task level at which you pass budget information should correspond to the level specified in the planning level of a budget or forecast. For example, if the planning level specifies that you can enter a budget at the top task level, then this API passes top tasks and project level budget and forecast amounts.
- If descriptive Flexfields are defined for a resource assignment, you can pass them in as parameters.
- A draft budget does not require you to create budget lines simultaneously.
- For budgets or forecasts created using financial plan types, multiple working versions can exist along with one current working version. The P_CREATE_NEW_CURR_WORKING_FLAG and P_REPLACE_CURRENT_WORKING_FLAG parameters determine whether the new budget version is created as a current working version and whether the new version replaces (deletes) the existing current working version.

- If a working budget or forecast version exists for a project and financial plan type, creating a new working budget or forecast version with P_CREATE_NEW_CURR_WORKING_FLAG set to N creates a new working budget or forecast version with budget lines.

- If a current working budget or forecast version exists for a project and financial plan type, creating a new working budget or forecast version with P_CREATE_NEW_CURR_WORKING_FLAG set to Y marks the newly created budget or forecast version as Current Working.

- If a current working budget or forecast version exists for a project and financial plan type, creating a new working budget or forecast version with P_REPLACE_CURRENT_WORKING_FLAG set to Y deletes the existing Current Working budget or forecast version and budget lines, and marks the newly created budget or forecast version as Current Working.

- All business rules for creating a budget or forecast version for a financial plan type are applicable when using this API. For example, if the Current Working version is locked by another user, and P_CREATE_NEW_CURR_WORKING_FLAG or P_REPLACE_CURRENT_WORKING_FLAG parameters are set to Y, then an appropriate message is returned that the Current Working version is locked and cannot be replaced or deleted.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_PM_PRODUCT_CODE

- P_BUDGET_VERSION_NAME

DELETE_BASELINE_BUDGET

DELETE_BASELINE_BUDGET is a PL/SQL procedure used to delete a baseline version in Oracle Projects for either a project and budget type, or a project and financial plan type.

Business Rules

This section describes general business rules, and rules for using this procedure with versions created for budget types and for financial plan types.

General Rules

- For budgets that do not use budgetary controls, you can use this procedure to delete any baseline version except the following:

    - Current (latest version)
    - Current Original
- For budgets that use budgetary controls, you can use this procedure to delete any baseline version except the following:
    - Current (latest version)
    - If budgetary control balances exist, the version previous to the Current version
    - Current Original
- You cannot use this procedure to delete draft or working versions and submitted versions.
- Oracle Projects establishes the following links between information stored in your system and certain information in Oracle Projects. You can use the following parameters instead of their corresponding Oracle Projects identification codes:
    - P_PM_PROJECT_REFERENCE links to P_PA_PROJECT_ID.
    - P_FIN_PLAN_TYPE_NAME links to P_FIN_PLAN_TYPE_ID.
- Products that call budget APIs must specify their respective product codes. Oracle Projects predefines product codes and provides these codes to the appropriate vendors.
- To delete a baseline version and its corresponding lines, you must specify a value for the parameter P_VERSION_NUMBER.
    - If you specify a value for a current original or current baseline version, then the procedure will abort.
    - If budgetary controls are enabled and you specify a value for a previous baseline version that has budgetary control balances, then the procedure will abort.
- Oracle Projects function security controls deletion of the following classes of baseline versions. These baseline classes apply to versions for budget types and financial plan types:
    - Approved Budget (Cost or Revenue): Financials: Project: Approved Budget: Delete Baseline Version
    - Budget (not approved cost or revenue): Financials: Project: Budget: Delete Baseline Version

- Forecast (applicable to financial planning only): Financials: Project: Forecast: Delete Approved Version

Budget Types

- The following parameters are not used for planning with budget types:
  - P_FIN_PLAN_TYPE_ID
  - P_FIN_PLAN_TYPE_NAME
  - P_VERSION_TYPE
- You cannot use this procedure to delete a baseline version for a forecast budget type.

Financial Plan Types

- All business rules for deleting a baseline version for a financial plan type in the user interface are applicable when you use this procedure.
- The following parameter is not used for planning with financial plan types:
  - P_BUDGET_TYPE_CODE
- You must specify a value for the parameter P_VERSION_TYPE if cost and revenue are planned separately.
- You cannot use this procedure to delete a baseline version under the following conditions:
  - A version for an organization forecast
  - A workplan version

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

The parameters that identify the version are listed below:

- P_PA_PROJECT_ID

- P_BUDGET_TYPE_CODE
- P_FIN_PLAN_TYPE_ID
- P_VERSION_TYPE
- P_VERSION_NUMBER

DELETE_BUDGET_LINE

DELETE_BUDGET_LINE is a PL/SQL procedure used to delete a line from a draft or working version in Oracle Projects for either a project and budget type, or a project and financial plan type.

Business Rules

This section describes general business rules, and rules for using this procedure with versions created for budget types and for financial plan types.

General Rules

- After you use DELETE_BUDGET_LINE to delete one or more lines from a draft or working version, save the data before you call the procedure BASELINE_BUDGET. (A working version may require approval before you can create a baseline.)
- You can delete lines only from draft or working versions. You cannot delete lines from a submitted or baseline version. You cannot delete lines from an approved revenue budget working version if the autobaseline feature is enabled.
- Oracle Projects establishes the following links between information stored in your system and certain information in Oracle Projects. You can use the following parameters instead of their corresponding Oracle Projects identification codes:
  - P_PM_PROJECT_REFERENCE links to P_PA_PROJECT_ID.
  - P_FIN_PLAN_TYPE_NAME links to P_FIN_PLAN_TYPE_ID.
  - P_PM_TASK_REFERENCE links to P_PA_TASK_ID.
  - P_RESOURCE_ALIAS links to P_RESOURCE_LIST_MEMBER_ID.
- Products that call budget APIs must specify their respective product codes. Oracle Projects predefines product codes and provides these codes to the appropriate vendors.
- You do not need to specify values for the following pair of parameters if the version is not categorized by resources:

- P_RESOURCE_ALIAS and P_RESOURCE_LIST_MEMBER_ID

- Oracle Projects does not validate a date value specified for the parameter P_START_DATE.

- If a version is time-phased by PA periods, then the value specified for the parameter P_PERIOD_NAME must map to a PA period. Likewise, if a version is time-phased by GL periods, then the value specified for the parameter P_PERIOD_NAME must map to a GL period. If the value specified for P_PERIOD_NAME is invalid, then the procedure will abort.

- All business rules for deleting a line from a version for a budget type or a financial plan type in the user interface are applicable when you use this procedure.

Budget Types

- The following parameters are not used for planning with budget types:
  - P_FIN_PLAN_TYPE_ID
  - P_FIN_PLAN_TYPE_NAME
  - P_VERSION_NUMBER
  - P_VERSION_TYPE
  - P_CURRENCY_CODE

- You cannot use this procedure to delete a budget line for a forecast budget type.

- If no values are specified for the parameters P_START_DATE and P_PERIOD_NAME, then the procedure deletes all budget lines for a task/resource combination.

- If no value is specified for the parameter P_PERIOD_NAME, then the procedure uses the parameter P_START_DATE to determine the period.

- If values are specified for the parameter P_START_DATE and the parameter P_PERIOD_NAME, then the procedure uses P_PERIOD_NAME to derive the start date.

- The following rules apply to the budget entry method:
  - Depending on the budget entry method, this procedure may require you to specify task and resource data.
  - If no task data is specified, then Oracle Projects assumes that the budget entry

method specifies uncategorized budgeting (budgets not tracked by resource) and project-level budgeting.

- If the budget entry method for the version is not time-phased by PA or GL periods, and values are specified for either the parameter P_START_DATE or the parameter P_PERIOD_NAME, then the procedure will abort.

- For date-range budgets, the parameter P_START_DATE corresponds to the start date of the budget line date range. For budgets time-phased by PA or GL periods, the parameter, P_START_DATE corresponds to the start date of the period for which the budget line is defined.

Financial Plan Types

- The following parameter is not used for planning with financial plan types:
  - P_BUDGET_TYPE_CODE

- If no value is specified for the parameter P_VERSION_NUMBER, then this procedure deletes a line from the current working version. You must provide a value for this parameter to delete a line from a version other than the current working version.

- You must specify a value for the parameter P_VERSION_TYPE if cost and revenue are planned separately.

- You cannot use this procedure to delete a line under the following conditions:
  - If the option to allow edit after initial baseline is not enabled for the financial plan type, then you cannot modify a working version after you create a baseline.

  - A budget or forecast version is locked by another user or is locked for processing

  - A budget or forecast version has processing errors

  - A change document version

  - A version for an organization forecast

  - A workplan version

- Depending on the planning options defined for the version, this procedure may require you to specify task and resource data.

- You must specify a value for the parameter P_CURRENCY_CODE if you are

planning in multiple transaction currencies.

- If no values are specified for the parameters P_CURRENCY_CODE, P_START_DATE, and P_PERIOD_NAME, then the procedure deletes all lines for the specified task/resource combination.
- If you specify a value for the parameter P_CURRENCY_CODE, and do not specify values for the parameters P_START_DATE and P_PERIOD_NAME, then the procedure deletes all lines for the specified currency code and task/resource combination.
- If no value is specified for the parameter P_PERIOD_NAME, then the procedure uses the value specified for the parameter P_START_DATE to determine the period.
- If values are specified for the parameters P_START_DATE and P_PERIOD_NAME, then the procedure uses P_PERIOD_NAME to derive the start date.

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

The parameters that identify the version and line are listed below:

- P_PA_PROJECT_ID
- P_BUDGET_TYPE_CODE
- P_FIN_PLAN_TYPE_ID
- P_VERSION_TYPE
- P_VERSION_NUMBER
- P_PA_TASK_ID
- P_RESOURCE_LIST_MEMBER_ID
- P_CURRENCY_CODE
- P_START_DATE
- P_PERIOD_NAME

DELETE_DRAFT_BUDGET

DELETE_DRAFT_BUDGET is a PL/SQL procedure used to delete a draft or working version in Oracle Projects for either a project and budget type, or a project and financial plan type.

Business Rules

This section describes general business rules, and rules for using this procedure with versions created for budget types and for financial plan types.

General Rules

- You can delete only draft or working versions. You cannot delete a submitted or baseline version. You cannot delete an approved revenue budget working version if the autobaseline feature is enabled.
- Oracle Projects establishes the following links between information stored in your system and certain information in Oracle Projects. You can use the following parameters instead of their corresponding Oracle Projects identification codes:
  - P_PM_PROJECT_REFERENCE links to P_PA_PROJECT_ID.
  - P_FIN_PLAN_TYPE_NAME links to P_FIN_PLAN_TYPE_ID.
- Products that call budget APIs must specify their respective product codes. Oracle Projects predefines product codes and provides these codes to the appropriate vendors.
- All business rules for deleting a draft or working version for a budget type or a financial plan type in the user interface are applicable when you use this procedure.

Budget Types

- The following parameters are not used for planning with budget types:
  - P_FIN_PLAN_TYPE_ID
  - P_FIN_PLAN_TYPE_NAME
  - P_VERSION_NUMBER
  - P_VERSION_TYPE
- You cannot use this procedure to delete a working version for a forecast budget type.

Financial Plan Types

- The following parameter is not used for planning with financial plan types:
  - P_BUDGET_TYPE_CODE
- If no value is specified for the parameter P_VERSION_NUMBER, then this procedure deletes the current working version. You must provide a value for this parameter to delete a version other than the current working version.
- You must specify a value for the parameter P_VERSION_TYPE if cost and revenue are planned separately.
- You cannot use this procedure to delete a working version under the following conditions:
  - If the option to allow edit after initial baseline is not enabled for the financial plan type, then you cannot delete a working version after you create a baseline.
  - A budget or forecast version is locked by another user or is locked for processing
  - A budget or forecast version has processing errors
  - A change document version
  - A version for an organization forecast
  - A workplan version

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

Parameter that identify the version are listed below:

- P_PA_PROJECT_ID
- P_BUDGET_TYPE_CODE
- P_FIN_PLAN_TYPE_ID
- P_VERSION_TYPE

- P_VERSION_NUMBER

GET_PROJECT_ID

To retrieve information about all the financial plan types attached to a project, the project context must be set. GET_PROJECT_ID returns the PROJECT_ID for the project in context used by the public view PA_FINPLAN_TYPES_V. This view is used by Oracle Project Connect.

SET_PROJECT_ID

SET_PROJECT_ID used to set thepublic variable G_PROJECT_ID which is used by public view PA_FINPLAN_TYPES_V. This view is used by Oracle Project Connect.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The required parameters for SET_PROJECT_ID are listed below:

- P_PROJECT_ID

UPDATE_BUDGET

UPDATE_BUDGET is a PL/SQL procedure used to update a draft or working version in Oracle Projects for either a project and budget type, or a project and financial plan type. This procedure updates existing lines or inserts new lines, depending on whether lines already exist.

This API uses composite datatypes. For more information, see APIs That Use Composite Datatypes, page 2-22.

Business Rules

This section describes general business rules, and rules for using this procedure with versions created for budget types and for financial plan types.

General Rules

- After you use UPDATE_BUDGET to update a draft or working version, save the data before you call the procedure BASELINE_BUDGET. (A working version may require approval before you can create a baseline.)

- You can update only draft or working versions. You cannot update submitted or baseline versions. You cannot update an approved revenue budget working version if the autobaseline feature is enabled.

- With respect to lines, you can use this procedure only to update existing lines or to

add lines. To delete existing lines, use the procedure DELETE_BUDGET_LINE.

- Oracle Projects establishes the following links between information stored in your system and certain information in Oracle Projects. You can use the following parameters instead of their corresponding Oracle Projects identification codes:
  - P_PM_PROJECT_REFERENCE links to P_PA_PROJECT_ID.
  - P_FIN_PLAN_TYPE_NAME links to P_FIN_PLAN_TYPE_ID.
  - PM_TASK_REFERENCE links to PA_TASK_ID.
  - RESOURCE_ALIAS links to RESOURCE_LIST_MEMBER_ID.
- Products that call budget APIs must specify their respective product codes. Oracle Projects predefines product codes and provides these codes to the appropriate vendors.
- You do not need to specify values for the following pair of parameters if the version is not categorized by resources:
  - RESOURCE_ALIAS and RESOURCE_LIST_MEMBER_ID
- If a version is time-phased by period, then Oracle Projects identifies a line either by the start date or period name. Therefore, you cannot change start dates and period names for lines.
- The following rules apply for versions that are time-phased by PA or GL periods:
  - If a valid value is specified for the parameter PERIOD_NAME, then this procedure updates the line for the specified period.

    If a version is time-phased by PA periods, then the value specified for the parameter PERIOD_NAME must map to a PA period. Likewise, if a version is time-phased by GL periods, then the value specified for PERIOD_NAME must map to a GL period.

    If the value specified for PERIOD_NAME is invalid, then the procedure will abort.
  - If values are specified for the parameter BUDGET_START_DATE and the parameter PERIOD_NAME, then the procedure uses PERIOD_NAME to determine the period.
  - If no value is specified for the parameter PERIOD_NAME, then the procedure uses the parameter BUDGET_START_DATE to determine the period.

    If a version is time-phased by PA periods, then the value for the parameter BUDGET_START_DATE must map to the start date of a PA period. Likewise, if

a version is time-phased GL periods, then the value for the parameter BUDGET_START_DATE must map to the start date of a GL period.

If Oracle Projects cannot determine a valid period name, then the procedure will abort.

- If no values are specified for the parameter BUDGET_START_DATE and the parameter PERIOD_NAME, then the procedure will abort.

- If Descriptive Flexfields are defined, then you can pass them as IN parameters.
- All business rules for updating a version for a budget type or a financial plan type in the user interface are applicable when you use this procedure.

Budget Types

- The following parameters are not used for planning with budget types:
  - P_FIN_PLAN_TYPE_ID
  - P_FIN_PLAN_TYPE_NAME
  - P_BUDGET_VERSION_NUMBER
  - P_VERSION_TYPE
  - TXN_CURRENCY_CODE
  - All currency conversion attributes
- You cannot use this procedure to update a budget version or budget lines for a forecast budget type.
- Specify values for the parameters PA_TASK_ID or PM_TASK_REFERENCE only when planning by tasks, as defined by the budget entry method.
- Specify values for the parameter PERIOD_NAME only when planning by PA or GL period, as defined by the budget entry method.
- The task level at which you specify budget information should correspond to the level specified in the budget entry method. For example, if the budget entry method specifies that you can enter a budget only at the lowest task level, then this procedure should pass only lowest tasks.
- When the budget entry method (BEM) restricts entry of a certain field as shown in the following table, do not specify values for the corresponding parameter.

BEM Setting	Related Parameter
Cost quantity not enterable	quantity
Raw cost not enterable	raw_cost
Burdened cost not enterable	burdened_cost
Revenue quantity not enterable	quantity
Revenue not enterable	revenue

- If a project and a budget type are enabled for budgetary controls, then you cannot update or add budget lines for GL periods that are after the latest encumbrance year defined in the ledger associated with the project.

Financial Plan Types

- The following parameter is not used for planning with financial plan types:
  - P_BUDGET_TYPE_CODE
- If no value is specified for the parameter P_BUDGET_VERSION_NUMBER, then this procedure updates a line for the current working version.
- You can specify values for the parameters PA_TASK_ID or PM_TASK_REFERENCE only when planning by tasks, as defined by the planning level of the budget or forecast.
- The task level at which you specify plan information should correspond to the level specified in the planning level of a budget or forecast version. For example, if the planning level specifies that you can enter a budget or forecast at the top task level, then this procedure should pass only top task and project-level budget and forecast amounts.
- You cannot use this procedure to update a working version under the following conditions:
  - If the option to allow edit after initial baseline is not enabled for the financial plan type, then you cannot modify a working version after you create a baseline.
  - A budget or forecast version is locked by another user or is locked for processing

- A budget or forecast version has processing errors
- A change document version
- A version for an organization forecast
- A workplan version

- When the amount entry options restrict entry of certain fields as shown in the following table, do not specify values for the corresponding parameters. In these cases, the budget or forecast is created with the specified amount entry options and edit of the corresponding quantities and amounts is not allowed.

Amount Entry Option Setting	Related Parameter
Cost quantity not enterable	quantity (used when the version is for cost only)
Revenue quantity not enterable	quantity (used when the version is for revenue only)
Quantity not enterable	quantity (used when cost and revenue are planned together in the same version)
Raw cost not enterable	raw_cost
Burdened cost not enterable	burdened_cost
Revenue not enterable	revenue

- You can specify values for the parameters RAW_COST and BURDENED_COST only for budgets or forecasts for which the financial plan type allows planning for cost, or for cost and revenue together in the same version.
- You can specify a value for the parameter REVENUE only for a budget or forecast for which the financial plan type allows planning for revenue, or for cost and revenue together in the same version.

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER

- P_PM_PRODUCT_CODE

Parameter in this procedure that identify the version and line are listed below:

- P_PA_PROJECT_ID
- P_BUDGET_TYPE_CODE
- P_FINPLAN_TYPE_ID
- P_VERSION_TYPE
- P_BUDGET_VERSION_NUMBER

Table of Record: P_BUDGET_LINES_IN

The following table describes the data structure for the parameter P_BUDGET_LINES_IN shown in the parameters table.

Parameter names marked with an asterisk (*) in the following table identify the version and line.

Name	Usage	Type	Req?	Description
PA_TASK_ID*	IN	NUMBER	No	Identifier for the task in Oracle Projects
PM_TASK_REFERENCE*	IN	VARCHAR2 (30)	No	The reference code that uniquely identifies the task in the external system
RESOURCE_ALIAS*	IN	VARCHAR2 (80)	No	Alias of a resource uniquely identifies the task in the external system
RESOURCE_LIST _MEMBER_ID*	IN	NUMBER	No	The identification code of the resource
TXN_CURRENCY_CODE*	IN	VARCHAR2 (15)	No	Financial plan currency identifier. Required if planning in multiple transaction currencies.
PERIOD_NAME*	IN	VARCHAR2 (30)	No	GL or PA period name
BUDGET_START_DATE*	IN	DATE	No	Start date of budget line
BUDGET_END_DATE*	IN	DATE	No	End date of budget line

Name	Usage	Type	Req?	Description
QUANTITY	IN	NUMBER	No	Budgeted quantity
RAW_COST	IN	NUMBER	No	Budgeted raw cost amount
BURDENED_COST	IN	NUMBER	No	Budgeted burdened cost amount
REVENUE	IN	NUMBER	No	Budgeted revenue amount
CHANGE_REASON_CODE	IN	VARCHAR2 (30)	No	Code that identifies the change reason for the line
DESCRIPTION	IN	VARCHAR2 (255)	No	Line description
PROJFUNC_COST_RATE_TYPE	IN	VARCHAR2 (30)	No	Project functional currency cost rate type for financial plan types
PROJFUNC_COST_RATE_DATE_TYP	IN	VARCHAR2 (30)	No	Project functional currency cost rate date type for financial plan types
PROJFUNC_COST_RATE_DATE	IN	DATE	No	Project functional currency cost rate date for financial plan types
PROJFUNC_COST_EXCHANGE_RATE	IN	NUMBER	No	Project functional currency cost exchange rate for financial plan types
PROJFUNC_REV_RATE_TYPE	IN	VARCHAR2 (30)	No	Project functional currency revenue rate type for financial plan types
PROJFUNC_REV_RATE_DATE_TYP	IN	VARCHAR (30)	No	Project functional currency revenue rate date type for financial plan types
PROJFUNC_REV_RATE_DATE	IN	DATE	No	Project functional currency revenue rate date for financial plan types
PROJFUNC_REV_EXCHANGE_RATE	IN	NUMBER	No	Project functional currency revenue exchange rate for financial plan types

Name	Usage	Type	Req?	Description
PROJECT_COST_RATE_TYPE	IN	VARCHAR2 (30)	No	Project currency cost rate type for financial plan types
PROJECT_COST_RATE_DATE_TYP	IN	VARCHAR2 (30)	No	Project currency cost rate date type for financial plan types
PROJECT_COST_RATE_DATE	IN	DATE	No	Project currency cost rate date for financial plan types
PROJECT_COST_EXCHANGE_RATE	IN	NUMBER	No	Project currency cost exchange rate for financial plan types
PROJECT_REV_RATE_TYPE	IN	VARCHAR2 (30)	No	Project currency revenue rate type for financial plan types
PROJECT_REV_RATE_DATE_TYP	IN	VARCHAR2 (30)	No	Project currency revenue rate date type for financial plan types
PROJECT_REV_RATE_DATE	IN	DATE	No	Project currency revenue rate date for financial plan types
PROJECT_REV_EXCHANGE_RATE	IN	NUMBER	No	Project currency revenue exchange rate for financial plan types
PM_PRODUCT_CODE	IN	VARCHAR2 (30)	No	The product code of the vendor of the external system
PM_BUDGET_LINE_REFERENCE	IN	VARCHAR2 (30)	No	Reference code that identifies the budget line on the client side
ATTRIBUTE_CATEGORY	IN	VARCHAR2 (30)	No	Used by Descriptive Flexfields
ATTRIBUTE1 THROUGH ATTRIBUTE15	IN	VARCHAR2 (150)	No	Budget line Descriptive Flexfields

Table of Record: P_BUDGET_LINES_OUT

The following table shows the data structure for the parameter

P_BUDGET_LINES_OUT shown in the parameters table.

Name	Usage	Type	Req?	Description
RETURN_STATUS	IN	VARCHAR2(1)	No	Return status

UPDATE_BUDGET_LINE

UPDATE_BUDGET_LINE is a PL/SQL procedure used to update a line for a draft or working version in Oracle Projects for either a project and budget type, or a project and financial plan type.

Business Rules

This section describes general business rules, and rules for using this procedure with versions created for budget types and for financial plan types.

General Rules

- After you use UPDATE_BUDGET_LINE to update a line for a draft or working version, save the data before you call the procedure BASELINE_BUDGET. (A working version may require approval before you can create a baseline.)
- You can update lines only for draft or working versions. You cannot update lines for submitted or baseline versions. You cannot update lines for an approved revenue budget working version if the autobaseline feature is enabled.
- Oracle Projects establishes the following links between information stored in your system and certain information in Oracle Projects. You can use the following parameters instead of their corresponding Oracle Projects identification codes:
  - P_PM_PROJECT_REFERENCE links to P_PA_PROJECT_ID.
  - P_FIN_PLAN_TYPE_NAME links to P_FIN_PLAN_TYPE_ID.
  - P_PM_TASK_REFERENCE links to P_PA_TASK_ID.
  - P_RESOURCE_ALIAS links to P_RESOURCE_LIST_MEMBER_ID.
- Products that call budget APIs must specify their respective product codes. Oracle Projects predefines product codes and provides these codes to the appropriate vendors.
- You do not need to specify values for the following pair of parameters if the version is not categorized by resources:

- P_RESOURCE_ALIAS and P_RESOURCE_LIST_MEMBER_ID

- If a version is time-phased by period, then Oracle Projects identifies a line either by the start date or period name. Therefore, you cannot change start dates and period names for lines.

- The following rules apply for versions that are time-phased by PA or GL periods:
  - If a valid value is specified for the parameter P_PERIOD_NAME, then this procedure updates the line for the specified period.

    If a version is time-phased by PA periods, then the value specified for the parameter P_PERIOD_NAME must map to a PA period. Likewise, if a version is time-phased by GL periods, then the value specified for P_PERIOD_NAME must map to a GL period.

    If the value specified for P_PERIOD_NAME is invalid, then the procedure will abort.

  - If values are specified for the parameter P_BUDGET_START_DATE and the parameter P_PERIOD_NAME, then the procedure uses P_PERIOD_NAME to determine the period.

  - If no value is specified for the parameter P_PERIOD_NAME, then the procedure uses the parameter P_BUDGET_START_DATE to determine the period.

    If a version is time-phased by PA periods, then the value for the parameter P_BUDGET_START_DATE must map to the start date of a PA period. Likewise, if a version is time-phased GL periods, then the value for the parameter P_BUDGET_START_DATE must map to the start date of a GL period.

    If Oracle Projects cannot determine a valid period name, then the procedure will abort.

  - If no values are specified for the parameter P_BUDGET_START_DATE and the parameter P_PERIOD_NAME, then the procedure will abort.

- If Descriptive Flexfields are defined, then you can pass them as IN parameters.

- All business rules for updating lines for a budget type or a financial plan type in the user interface are applicable when you use this procedure.

Budget Types

- The following parameters are not used for planning with budget types:
  - P_FIN_PLAN_TYPE_ID

- P_FIN_PLAN_TYPE_NAME
- P_VERSION_NUMBER
- P_VERSION_TYPE
- P_CURRENCY_CODE
- All currency conversion attributes

- You cannot use this procedure to update budget lines for a forecast budget type.
- Specify values for the parameters P_PA_TASK_ID or P_PM_TASK_REFERENCE only when planning by tasks, as defined by the budget entry method.
- Specify values for the parameter P_PERIOD_NAME only when planning by PA or GL period, as defined by the budget entry method.
- The task level at which you specify budget information should correspond to the level specified in the budget entry method. For example, if the budget entry method specifies that you can enter a budget only at the lowest task level, then this procedure should pass only lowest tasks.
- When the budget entry method (BEM) restricts entry of a certain field as shown in the following table, do not specify values for the corresponding parameter.

BEM Setting	Related Parameter
Cost quantity not enterable	p_quantity
Raw cost not enterable	p_raw_cost
Burdened cost not enterable	p_burdened_cost
Revenue quantity not enterable	p_quantity
Revenue not enterable	p_revenue

- If a project and a budget type are enabled for budgetary controls, then you cannot update or add budget lines for GL periods that are after the latest encumbrance year defined in the ledger associated with the project.

Financial Plan Types

- The following parameter is not used for planning with financial plan types:
  - P_BUDGET_TYPE_CODE
- If no value is specified for the parameter P_VERSION_NUMBER, then this procedure updates a line for the current working version.
- You can specify values for the parameters P_PA_TASK_ID or P_PM_TASK_REFERENCE only when planning by tasks, as defined by the planning level of the budget or forecast.
- The task level at which you specify plan information should correspond to the level specified in the planning level of a budget or forecast version. For example, if the planning level specifies that you can enter a budget or forecast at the top task level, then this procedure should pass only top task and project-level budget and forecast amounts.
- You cannot use this procedure to update a working version under the following conditions:
  - If the option to allow edit after initial baseline is not enabled for the financial plan type, then you cannot modify a working version after you create a baseline.
  - A budget or forecast version is locked by another user or is locked for processing
  - A budget or forecast version has processing errors
  - A change document version
  - A version for an organization forecast
  - A workplan version
- When the amount entry options restrict entry of certain fields as shown in the following table, do not specify values for the corresponding parameters. In these cases, the budget or forecast is created with the specified amount entry options and edit of the corresponding quantities and amounts is not allowed.

Amount Entry Option Setting	Related Parameter
Cost quantity not enterable	p_quantity (used when the version is for cost only)

Amount Entry Option Setting	Related Parameter
Revenue quantity not enterable	p_quantity (used when the version is for revenue only)
Quantity not enterable	p_quantity (used when cost and revenue are planned together in the same version)
Raw cost not enterable	p_raw_cost
Burdened cost not enterable	p_burdened_cost
Revenue not enterable	p_revenue

- You can specify values for the parameters P_RAW_COST and P_BURDENED_COST only for budgets or forecasts for which the financial plan type allows planning for cost, or for cost and revenue together in the same version.
- You can specify a value for the parameter P_REVENUE only for a budget or forecast for which the financial plan type allows planning for revenue, or for cost and revenue together in the same version.

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters in this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE

The parameters in this procedure that identify the version and line are listed below:

- P_PA_PROJECT_ID
- P_BUDGET_TYPE_CODE
- P_FIN_PLAN_TYPE_ID
- P_VERSION_TYPE
- P_VERSION_NUMBER
- P_PA_TASK_ID

- P_RESOURCE_LIST_MEMBER_ID
- P_CURRENCY_CODE
- P_BUDGET_START_DATE
- P_PERIOD_NAME

CLEAR_BUDGET

CLEAR_BUDGET is a Load-Execute-Fetch procedure used to clear the global data structures set up during the Initialize step.

CLEAR_CALCULATE_AMOUNTS

CLEAR_CALCULATE_AMOUNTS is a Load-Execute-Fetch procedure used to reset the global data structures used by the Load-Execute-Fetch procedure CALCULATE_AMOUNTS. The procedure CALCULATE_AMOUNTS calls CLEAR_CALCULATE_AMOUNTS to.initialize the data structure that is used to fetch the calculated amounts for a plan version.

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EXECUTE_CALCULATE_AMOUNTS

EXECUTE_CALCULATE_AMOUNTS is a Load-Execute-Fetch procedure used to calculate the raw cost, burdened cost, and revenue amounts using existing budget lines for a given project and budget type, or financial plan type. For each budget line, this API writes to globals that can be read by the API FETCH_CALCULATE_AMOUNTS.

Business Rules

- The following parameters are used only for budgets that are created for a financial plan type:
  - P_BUDGET_VERSION_ID
  - P_FIN_PLAN_TYPE_ID
  - P_FIN_PLAN_TYPE_NAME
  - P_VERSION_TYPE
  - P_BUDGET_VERSION_NUMBER
- Because this API calls the PA_CLIENT_EXTN_BUDGET extension, you must modify the extension to calculate the amounts you want.

- You must pass an uppercase 'Y' for each calculation flag to recalculate the corresponding amount.
- Regardless of its update status, this API returns one row of amounts for each budget line it reads.
- To update the budget lines for a project with the calculated amounts generated from this API, you must set the P_UPDATE_DB_FLAG to an uppercase 'Y'.
- This API returns the total number of budget lines processed in the OUT parameter P_TOT_BUDGET_LINES_CALCULATED. This total determines how many times to call FETCH_CALCULATE_AMOUNTS in a loop.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for EXECUTE_CALCULATE_AMOUNTS are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_BUDGET_TYPE_CODE

EXECUTE_CREATE_DRAFT_BUDGET

EXECUTE_CREATE_DRAFT_BUDGET is used to create a budget and its budget lines using the data stored in the global tables during the Load process.

Business Rules

The following parameters are used for planning with financial plan types. These parameters are not used for planning with budget types.

- Plan type identifier and plan type name parameters
- Version type parameters
- P_TIME_PHASED_CODE
- P_PLAN_IN_MULTI_CURR_FLAG
- Currency attributes
- Flags for raw cost, burdened cost, revenue, quantity planning, create current working version, replace current working version
- P_USING_RESOURCE_LISTS_FLAG

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for EXECUTE_CREATE_DRAFT_BUDGET are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_BUDGET_TYPE_CODE
- P_ENTRY_METHOD_CODE

EXECUTE_CREATE_DRAFT_FINPLAN

EXECUTE_CREATE_DRAFT_FINPLAN creates budgets and forecasts using the data stored in the global tables during the Load process. Before calling this procedure, you should call LOAD_RESOURCE_INFO to load the resource information along with the quantity and amounts required for budget and forecast line creation.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for EXECUTE_CREATE_DRAFT_FINPLAN are listed below:

- P_PM_PRODUCT_CODE
- P_BUDGET_VERSION_NAME

EXECUTE_UPDATE_BUDGET

EXECUTE_UPDATE_BUDGET is a Load-Execute-Fetch procedure used to update a budget and its budget lines using the data stored in the global tables during the Load process.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for EXECUTE_UPDATE_BUDGET are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_BUDGET_TYPE_CODE

FETCH_BUDGET_LINE

FETCH_BUDGET_LINE is a Load-Execute-Fetch procedure used to retrieve the return status returned during the creation of a budget line from a global PL/SQL table.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for FETCH_BUDGET_LINE are listed below:

- P_API_VERSION_NUMBER
- P_LINE_INDEX

FETCH_CALCULATE_AMOUNTS

FETCH_CALCULATE_AMOUNTS is a Load-Execute-Fetch procedure used to get the raw cost, burdened cost, and revenue amounts by budget line from global records updated by the API EXECUTE_CALCULATE_AMOUNTS.

Call this API in a loop for each calculated budget line using the API EXECUTE_CALCULATE_AMOUNTS. The value the API EXECUTE_CALCULATE_AMOUNTS returns for P_TOT_BUDGET_LINES_CALCULATED determines how many times to call this API.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for FETCH_CALCULATE_AMOUNTS are listed below:

- P_API_VERSION_NUMBER

INIT_BUDGET

INIT_BUDGET is a Load-Execute-Fetch procedure used to set up the global data structures that other Load-Execute-Fetch procedures use to create a new or update an existing draft budget in Oracle Projects.

INIT_CALCULATE_AMOUNTS

INIT_CALCULATE_AMOUNTS is a Load-Execute-Fetch procedure used to set up the global data structures used by the Load-Execute-Fetch API CALCULATE_AMOUNTS.

LOAD_BUDGET_LINE

LOAD_BUDGET_LINE is a Load-Execute-Fetch procedure used to load a budget line to a global PL/SQL table.

The following parameters are used for planning with financial plan types. These

parameters are not used for planning with budget types.

- P_TXN_CURRENCY_CODE
- Currency attributes
- P_CHANGE_REASON_CODE

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for LOAD_BUDGET_LINE are listed below:

- P_API_VERSION_NUMBER
- P_TXN_CURRENCY_CODE

LOAD_RESOURCE_INFO

Call LOAD_RESOURCE_INFO before you call EXECUTE_CREATE_DRAFT_FINPLAN to load resource information required to create a budget or forecast. This procedure loads the resource information along with summary amounts to a global PL/SQL table used by EXECUTE_CREATE_DRAFT_FINPLAN.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. There are no required parameters for LOAD_RESOURCE_INFO.

Using Budget APIs

The following example describes how to create an interface between Oracle Projects and the budget and budget line information in your external system. Depending on your company's business needs, your own implementation of budget APIs may be more or less complex than the scenario shown here.

As you work through this example, you may want to refer to information elsewhere in this manual:

- For a detailed description of the budget APIs, see Budget APIs, page 6-7.
- Most of the Oracle Projects APIs use a standard set of input and output parameters. See Standard API Parameters, page 2-21.
- For an example of PL/SQL code that creates a budget using Load-Execute-Fetch APIs, see Creating a Budget Using the Load-Execute-Fetch APIs, page 6-63.
- For an example of PL/SQL code that creates a budget using APIs that use composite datatypes, see Creating a Budget Using a Composite Datatype API, page 6-66.

Step 1: Connect to an Oracle Database

To ensure that proper security is enforced while accessing Oracle Projects data, follow the steps in Security Requirements, page 2-8.

Step 2: Get the Budget Data

Before you send budget lines to the Oracle Projects database, you must first make some decisions that affect how the budget and budget lines are linked to other Oracle Projects data. This section provides sample SQL select statements upon which you can model your own. The following pages describe the relationship between the selected values and budget or budget line information. Understanding this relationship helps you to determine which parameter values to pass to the budget and budget line APIs.

Select the Budget Type

Select a valid budget type. Oracle Projects predefines the budget types shown in the following table:

Budget Type Code	Budget Type
AC	Approved Cost Budget
AR	Approved Revenue Budget
FC	Forecast Cost Budget
FR	Forecast Revenue Budget

The following SQL statement retrieves the budget type information:

```
SELECT code,
       name
FROM   pa_budget_types_v
```

The selected value CODE is related to the budget parameter P_BUDGET_TYPE_CODE.

Because cost and revenue budgets can contain different budget amounts, you must retrieve the budget amount code for the budget type. The following SQL statement retrieves the appropriate budget amount code:

```
SELECT budget_amount_code
FROM pa_budget_types
WHERE budget_type_code = &code
```

The statement returns C if you have chosen a cost budget, and R if you have chosen a revenue budget. The following table illustrates the amounts each budget type can hold and their relation to the parameters of LOAD_BUDGET_LINE:

Amount	LOAD_BUDGET_LINE Parameter
Raw Cost	P_RAW_COST
Burdened Cost	P_BURDENED_COST
Cost Quantity	P_QUANTITY
Revenue	P_REVENUE
Revenue Quantity	P_QUANTITY

Select the Budget Entry Method

Oracle Projects predefines the budget entry methods shown in the following table:

Budget Entry Method Code	Budget Entry Method
PA_LOWEST_TASK_BY_PA_PERIOD	By lowest tasks and PA period, categorized by resource
PA_LOWEST_TASK_BY_GL_PERIOD	By lowest tasks and GL period, categorized by resource
PA_LOWEST_TASK_BY_DATE_RANGE	By lowest tasks and date range, categorized by resource

The following SQL statement retrieves the budget entry method:

```
SELECT code
, name
, categorization_code
, entry_level_code
, entry_level_name
, time_phased_type_code
, time_phased_type_name
FROM pa_budget_entry_methods_v
```

The selected value CODE is related to the budget parameter P_ENTRY_METHOD_CODE.

You can use the other selected values later to retrieve other budget-related data from Oracle Projects. Possible values for other budget-related fields include:

- For CATEGORIZATION_CODE R Categorized by resource N Not categorized
- For ENTRY_LEVEL_CODE P Budgeting at the project level T Budgeting at the top task level L Budgeting at the lowest task level M Budgeting at both top and lowest task (mixed) level

- For TIME_PHASED_TYPE_CODE P Budget lines by PA periods G Budget lines by GL periods R Budget lines by date ranges N Budget lines not time-phased

Select a Resource List

If you select a budget entry method that is categorized by resources, you must select a resource list for the budget. The following SQL statement retrieves the resource list information:

```
SELECT resource_list_id
, resource_list_name
, description
FROM pa_qry_resource_lists_v
```

The following table illustrates the relationship between certain selected values and budget parameters. Pass only one of the two values:

Selected Value	Budget Parameter
RESOURCE_LIST_ID	P_RESOURCE_LIST_ID
RESOURCE_LIST_NAME	P_RESOURCE_LIST_NAME

Select Other Budget-Related Parameters

The parameter P_DESCRIPTION holds the description for a budget. Use the view PA_BUDGET_CHANGE_REASON_V to pass an explanation for any changes made to the budget. The following SQL statement retrieves the reason for the budget change:

```
SELECT code,
       name
FROM pa_budget_change_reason_v
```

The following table illustrates the relationship between certain selected values and budget parameters:

Selected Value	Budget Parameter
CODE	P_CHANGE_REASON_CODE
DESCRIPTION	P_DESCRIPTION

Step 3: Get Budget Line Data

The choices you made for your budget data strongly affect your budget line data. These effects are described on the following pages.

Select Amount Fields

As shown above, cost budgets can contain raw cost, burdened cost, and cost quantity amounts, while revenue budgets can contain only revenue and revenue quantity amounts.

Select Tasks

Depending on the budget entry level, the budget line should include the appropriate TASK_ID or TASK_REFERENCE. With project-level budgeting, you do not pass task-related parameters. With task-level budgeting (top, lowest, or mixed), you can use the following SQL statements to retrieve valid task values:

- Budget at the top task level

```
SELECT task_id
, pm_task_reference
, task_number
, task_name
FROM pa_tasks
WHERE project_id = &project_id
AND parent_task_id IS NULL
```

- Budget at the lowest task level

```
SELECT task_id
, pm_task_reference
, task_number
, task_name
FROM pa_tasks tasks1
WHERE  tasks1.project_id = &project_id
and not EXISTS (select NULL
 from pa_tasks tasks2
 where tasks1.project_id = tasks2.project_id
 and tasks1.task_id = tasks2.parent_task_id)
```

- Budget at the top and lowest task levels

```
SELECT task_id
, pm_task_reference
, task_number
, task_name
, decode(nvl(parent_task_id,'1'),1,'Y','N') TOP_TASK
FROM pa_tasks tasks1
WHERE tasks1.project_id = &project_id
and not EXISTS (select NULL
 from pa_tasks tasks2
 where tasks1.project_id = tasks2.project_id
 and tasks1.task_id = tasks2.parent_task_id)
or (tasks1.parent_task_id IS NULL
 and tasks1.project_id = &project_id )
```

The following table illustrates the relationship between certain selected values and budget line parameters. Pass only one of the two values:

Selected Value	Budget Line Parameter
TASK_ID	P_PA_TASK_ID
PM_TASK_REFERENCE	P_PM_TASK_REFERENCE

Select Resource List Members (Resources)

If your budget entry method is categorized by resources and you have selected a resource list, the budget line should include the individual resources associated with the resource list. You can use the following SQL statement to retrieve the resource list member information:

```
SELECT resource_list_member_id
, alias
, employee_first_name
, employee_last_name
FROM pa_query_res_list_members_v
WHERE resource_list_id = &resource_list_id
```

The following table illustrates the relationship between certain of the selected values and budget line parameters. Pass only one of the two values:

Selected Value	Budget Line Parameter
RESOURCE_LIST_MEMBER_ID	P_RESOURCE_LIST_MEMBER_ID
ALIAS	P_RESOURCE_ALIAS

Select Periods

How the budget entry method is time-phased affects which budget line parameters accept passed values, as shown in the following table:

Time-Phased By	Parameters That Accept Values (START_DATE, END_DATE, and PERIOD_NAME)
No Time-Phasing	None
Date Ranges	START_DATE and END_DATE

Time-Phased By	Parameters That Accept Values (START_DATE, END_DATE, and PERIOD_NAME)
PA or GL Period	START_DATE and END_DATE or PERIOD_NAME

When you use time-phased budgeting, you can use the following SQL statements to retrieve the appropriate date information:

- Period name

```
SELECT period_name
FROM pa_budget_periods_v
WHERE period_type_code = &time_phased_type_code
```

- Begin and end dates

```
SELECT period_start_date
, period_end_date
FROM pa_budget_periods_v
WHERE period_type_code = &time_phased_type_code
```

The following table illustrates the relationship between certain selected values and budget line parameters. You can pass a value for either the PERIOD_NAME or both the PERIOD_START_DATE and PERIOD_END_DATE:

Selected Value	Budget Line Parameter
PERIOD_NAME	P_PERIOD_NAME
PERIOD_START_DATE	P_BUDGET_START_DATE
PERIOD_END_DATE	P_BUDGET_END_DATE

Select Descriptions

You do not need to pass a description for budget lines.

Step 4: Interface Budget Information to the Server

If your external system supports composite datatype parameters, such as Oracle PL/SQL Version 2.3 or higher, you can call the CREATE_DRAFT_BUDGET and UPDATE_BUDGET APIs directly.

Not all external systems can call the APIs that use composite datatypes. Systems that do not support composite datatypes must call the supplementary Load-Execute-Fetch

APIs. The Load-Execute-Fetch procedures include Initialize, Load, Execute, Fetch, and Clear categories. For more information, see API Procedures, page 2-31.

Step 5: Start the Server-Side Process

After the Load procedure successfully moves budget and budget line data to the Oracle Projects database, call the procedure API EXECUTE_CREATE_DRAFT_BUDGET to process the budget and budget line data in the global PL/SQL tables.

Step 6: Retrieve Error Messages

Each Oracle Projects API includes standard output parameters:

- P_RETURN_STATUS shows if the API was executed successfully.
- P_MSG_COUNT shows the number of errors detected during the execution of the API.

If the API detects one error, the API returns the error message text. If the API detects multiple errors, use GET_MESSAGES to retrieve the error messages. See GET_MESSAGES, page 2-25.

If the error relates to a budget line, use FETCH_BUDGET_LINE to identify the line causing the error. The API parameter P_LINE_RETURN_STATUS identifies the line by returning either E (business rule violation) or U (unexpected error) for that line. (For more information about the return status, see Standard API Parameters, page 2-21. If you use FETCH_BUDGET_LINE for any other reason, it returns the error NO_DATA_FOUND.

Step 7: Finish the Load-Execute-Fetch Process

After executing the Fetch procedures and retrieving any error messages, finish the Load-Execute-Fetch process by calling the API CLEAR_BUDGET and either saving or rolling back your changes to the database.

Creating a Budget Using the Load-Execute-Fetch APIs

The following sample PL/SQL code is a sample of a script you can use to create a budget using the Load-Execute-Fetch APIs.

The Load-Execute-Fetch APIs use parameters with standard datatypes (VARCHAR2, NUMBER, and DATE). They do not use composite datatypes. If you create budgets using tools or products that support composite datatypes, see Creating a Budget Using a Composite Datatype API, page 6-66.

```
DECLARE
--variables needed for API standard parameters
l_api_version_number NUMBER :=1.0;
l_commit VARCHAR2(1):= 'F';
l_return_status VARCHAR2(1);
l_init_msg_list VARCHAR2(1);
l_msg_count NUMBER;
l_msg_data VARCHAR2(2000);
l_data VARCHAR2(2000);
l_msg_entity VARCHAR2(100);
l_msg_entity_index NUMBER;
l_msg_index NUMBER;
l_msg_index_out NUMBER;
l_encoded VARCHAR2(1);
i NUMBER;
a NUMBER;
--variables needed for Oracle Project specific parameters
l_pm_product_code VARCHAR2(10);
l_pa_project_id NUMBER;
l_pm_project_reference VARCHAR2(25);
l_budget_type_code VARCHAR2(30);
l_change_reason_code VARCHAR2(30);
l_description VARCHAR2(255);
l_entry_method_code VARCHAR2(30);
l_resource_list_name VARCHAR2(60);
l_resource_list_id NUMBER;
l_budget_lines_in pa_budget_pub.budget_line_in_tbl_type;
l_budget_lines_in_rec pa_budget_pub.budget_line_in_rec_type;
l_budget_lines_out pa_budget_pub.budget_line_out_tbl_type;
l_line_index NUMBER;
l_line_return_status VARCHAR2(1);
API_ERROR EXCEPTION;
BEGIN
--PRODUCT RELATED DATA
l_pm_product_code :='SOMETHING';
--BUDGET DATA
--l_pa_project_id:= 1138;
l_pm_project_reference := 'PROJECT_NAME';
l_budget_type_code := 'AC';
l_change_reason_code := 'ESTIMATING ERROR';
l_description := 'New description -> 2';
l_entry_method_code := 'PA_LOWEST_TASK_BY_DATE_RANGE';
l_resource_list_id := 1014;
--BUDGET LINES DATA
a := 5;
FOR i IN 1..a LOOP
if i = 1 THEN
l_budget_lines_in_rec.pa_task_id := 2440;
l_budget_lines_in_rec.resource_list_member_id := 1401;
elsif i = 2 THEN
l_budget_lines_in_rec.resource_list_member_id := 1402;
l_budget_lines_in_rec.pa_task_id := 2443;
elsif i = 3 THEN
l_budget_lines_in_rec.resource_list_member_id := 1404;
l_budget_lines_in_rec.pa_task_id := 2446;
elsif i = 4 THEN
l_budget_lines_in_rec.resource_list_member_id := 1407;
l_budget_lines_in_rec.pa_task_id := 2449;
elsif i = 5 THEN
l_budget_lines_in_rec.resource_list_member_id := 1408;
l_budget_lines_in_rec.pa_task_id := 2452;
```

```
end if;
l_budget_lines_in_rec.quantity :=93;
l_budget_lines_in_rec.budget_start_date := '05-MAY-95';
l_budget_lines_in_rec.budget_end_date := '09-MAY-95';
l_budget_lines_in_rec.raw_cost :=300;
l_budget_lines_in(i) := l_budget_lines_in_rec;
END LOOP;
-----------------------
--INIT_BUDGET
pa_budget_pub.init_budget;
-----------------------
--LOAD_BUDGET_LINE
FOR i IN 1..a LOOP
pa_budget_pub.load_budget_line( p_api_version_number =>
l_api_version_number
,p_return_status => l_return_status
,p_pa_task_id => l_budget_lines_in(i).pa_task_id
,p_pm_task_reference => l_budget_lines_in(i).pm_task_reference
,p_resource_alias => l_budget_lines_in(i).resource_alias
,p_resource_list_member_id =>
l_budget_lines_in(i).resource_list_member_id
,p_budget_start_date => l_budget_lines_in(i).budget_start_date
,p_budget_end_date => l_budget_lines_in(i).budget_end_date
,p_period_name => l_budget_lines_in(i).period_name
,p_description => l_budget_lines_in(i).description
,p_raw_cost => l_budget_lines_in(i).raw_cost
,p_burdened_cost => l_budget_lines_in(i).burdened_cost
,p_revenue => l_budget_lines_in(i).revenue
,p_quantity => l_budget_lines_in(i).quantity );
END LOOP;
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
-----------------------
--EXECUTE_CREATE_DRAFT_BUDGET
pa_budget_pub.execute_create_draft_budget
( p_api_version_number => l_api_version_number
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_return_status => l_return_status
,p_pm_product_code => l_pm_product_code
,p_pa_project_id => l_pa_project_id
,p_pm_project_reference => l_pm_project_reference
,p_budget_type_code => l_budget_type_code
,p_change_reason_code => l_change_reason_code
,p_description => l_description
,p_entry_method_code => l_entry_method_code
,p_resource_list_name => l_resource_list_name
,p_resource_list_id => l_resource_list_id );
IF l_return_status != 'S'
THEN
null; --RAISE API_ERROR;
END IF;
-----------------------
--FETCH_LINE
FOR l_line_index in
1..PA_BUDGET_PUB.G_budget_lines_tbl_count LOOP
pa_budget_pub.fetch_budget_line( p_api_version_number =>
l_api_version_number
,p_return_status => l_return_status
```

```
,p_line_index => l_line_index
,p_line_return_status => l_line_return_status);
IF l_return_status != 'S'
OR l_line_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
END LOOP;
-----------------------
--CLEAR_BUDGET
pa_budget_pub.clear_budget;
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
-----------------------
--HANDLE EXCEPTIONS
EXCEPTION
WHEN API_ERROR THEN
for i in 1..l_msg_count loop
pa_interface_utils_pub.get_messages (p_msg_data => l_msg_data
,p_data => l_data
,p_msg_count => l_msg_count
,p_msg_index_out => l_msg_index_out );
dbms_output.put_line ('error mesg '||l_data);
dbms_output.put_line ('error mesg '||l_msg_data);
end loop;
WHEN OTHERS THEN
for i in 1..l_msg_count loop
pa_interface_utils_pub.get_messages (p_msg_data => l_msg_data
,p_data => l_data
,p_msg_count => l_msg_count
,p_msg_index_out => l_msg_index_out );
dbms_output.put_line ('error mesg '||l_data);
end loop;
END;
/
```

Creating a Budget Using a Composite Datatype API

The following sample PL/SQL code is a script that creates a budget using the API CREATE_DRAFT_BUDGET, which uses composite datatypes. If you create budgets using tools or products that do not support composite datatypes, see Creating a Budget Using the Load-Execute-Fetch APIs, page 6-63.

```
DECLARE
--variables needed for API standard parameters
l_api_version_number NUMBER :=1.0;
l_commit VARCHAR2(1):= 'F';
l_return_status VARCHAR2(1);
l_init_msg_list VARCHAR2(1);
l_msg_count NUMBER;
l_msg_data VARCHAR2(2000);
l_data VARCHAR2(2000);
l_msg_entity VARCHAR2(100);
l_msg_entity_index NUMBER;
l_msg_index NUMBER;
l_msg_index_out NUMBER;
l_encoded VARCHAR2(1);
i NUMBER;
a NUMBER;
--variables needed for Oracle Projects-specific parameters
l_pm_product_codeVARCHAR2(10);
l_pa_project_id NUMBER;
l_pm_project_reference VARCHAR2(25);
l_budget_type_code VARCHAR2(30);
l_version_name VARCHAR2(30);
l_change_reason_code VARCHAR2(30);
l_description VARCHAR2(255);
l_entry_method_code VARCHAR2(30);
l_resource_list_name VARCHAR2(60);
l_resource_list_id NUMBER;
l_budget_lines_inpa_budget_pub.budget_line_in_tbl_type;
l_budget_lines_in_rec pa_budget_pub.budget_line_in_rec_type;
l_budget_lines_out pa_budget_pub.budget_line_out_tbl_type;
l_line_index NUMBER;
l_line_return_status VARCHAR2(1);
API_ERROR EXCEPTION;
BEGIN
--PRODUCT RELATED DATA
l_pm_product_code :='SOMETHING';
--BUDGET DATA
l_pm_project_reference := 'PROJECT_NAME';
l_budget_type_code := 'AC'; '--AR'; --
l_change_reason_code := 'ESTIMATING ERROR';
l_description := 'New description 2';
l_version_name := 'New version ';
l_entry_method_code := 'PA_LOWEST_TASK_BY_DATE_RANGE';
l_resource_list_id := 1014;
--BUDGET LINES DATA
a := 5;
FOR i IN 1..a LOOP
if i = 1 THEN
l_budget_lines_in_rec.pa_task_id := 2440;
l_budget_lines_in_rec.resource_list_member_id := 1401;
elsif i = 2 THEN
l_budget_lines_in_rec.resource_list_member_id := 1402;
l_budget_lines_in_rec.pa_task_id := 2443;
elsif i = 3 THEN
l_budget_lines_in_rec.resource_list_member_id := 1404;
l_budget_lines_in_rec.pa_task_id := 2446;
elsif i = 4 THEN
l_budget_lines_in_rec.resource_list_member_id := 1407;
l_budget_lines_in_rec.pa_task_id := 2449;
elsif i = 5 THEN
l_budget_lines_in_rec.resource_list_member_id := 1408;
```

```
l_budget_lines_in_rec.pa_task_id := 2452;
end if;
l_budget_lines_in_rec.quantity :=93;
l_budget_lines_in_rec.budget_start_date := '05-MAY-95';
l_budget_lines_in_rec.budget_end_date := '09-MAY-95';
l_budget_lines_in_rec.raw_cost :=300;
l_budget_lines_in(i) := l_budget_lines_in_rec;
END LOOP;
-----------------------
--INIT_BUDGET
pa_budget_pub.init_budget;
-----------------------
--CREATE_DRAFT_BUDGET
pa_budget_pub.create_draft_budget
( p_api_version_number => l_api_version_number
,p_msg_count => l_msg_count
,p_msg_data => l_msg_data
,p_return_status => l_return_status
,p_pm_product_code => l_pm_product_code
,p_pa_project_id => l_pa_project_id
,p_pm_project_reference => l_pm_project_reference
,p_budget_type_code => l_budget_type_code
,p_change_reason_code => l_change_reason_code
,p_budget_version_name => l_version_name
,p_description => l_description
,p_entry_method_code => l_entry_method_code
,p_resource_list_name => l_resource_list_name
,p_resource_list_id => l_resource_list_id
,p_budget_lines_in => l_budget_lines_in
,p_budget_lines_out => l_budget_lines_out );
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
-----------------------
--CLEAR_BUDGET
pa_budget_pub.clear_budget;
IF l_return_status != 'S'
THEN
RAISE API_ERROR;
END IF;
-----------------------
--HANDLE EXCEPTIONS
EXCEPTION
WHEN API_ERROR THEN
for i in 1..l_msg_count loop
pa_interface_utils_pub.get_messages (
p_msg_data => l_msg_data
,p_data => l_data
,p_msg_count => l_msg_count
,p_msg_index_out => l_msg_index_out );
dbms_output.put_line ('error mesg '||l_data);
end loop;

WHEN OTHERS THEN
for i in 1..l_msg_count loop
pa_interface_utils_pub.get_messages (
p_msg_data => l_msg_data
,p_data => l_data
,p_msg_count => l_msg_count
,p_msg_index_out => l_msg_index_out );
```

```
dbms_output.put_line ('error mesg '||l_data);
end loop;
END;
/
```

Refresh Planning Amounts API

The Refresh Planning Amounts API enables you to perform a mass refresh on conversion rates or cost rates on a project for an entire budget version, or for specific planning resources. Examples of scenarios where you might want to use this API are described below.

- **Refresh Conversion Rates for Material and Financial Items:** If your company changes the currency exchange rate schedule that they use, you can keep planning transaction amounts on all projects current by using this API to refresh the conversion rates for material and financial items on projects.

- **Refresh Cost and Bill Rates for People and Equipment:** If your company updates its cost and bill rate schedules, you can keep planning transaction amounts on all projects current by using this API to refresh the cost and bill rates for people and equipment on projects.

- **Refresh Rates on a Project Created from a Source Project**: When you create a project from a source project that has a defined workplan structure, the cost rates and bill rates are copied from the source project. The new project may use a different cost or bill rate schedule, or may have different currency conversion options. This API enables you to refresh rates on the newly created project.

- **Refresh Rates on a Financial Plan Generated from a Workplan:** If you generate a financial plan from a workplan, the rates on the financial plan are that of the source workplan. If you want to use the financial plan's rate setup, then you must refresh the rates for the financial plan.

REFRESH_RATES

The refresh rates procedure enables you to refresh conversion rates, cost rates, and bill rates in both workplans and financial plans. The internal name of the procedure is pa_fp_calc_plan_pub.refresh_rates. The procedure is contained in the public API package PA_FP_CALC_PLAN_PUB.

Business Rules

- You must supply a value for either P_PROJECT_ID or P_PM_PROJECT_REFERENCE. (These parameters have "Conditional" indicated in the "Required?" column.)

- You must supply a value for the parameter P_STRUCTURE_VERSION_ID if the

value of P_UPDATE_PLAN_TYPE is WORKPLAN.

- If the value of P_UPDATE_PLAN_TYPE is FINPLAN, then either P_BUDGET_VERSION_ID must have a value, or the following four parameters must all have a value.
  - P_VERSION_TYPE
  - P_BUDGET_VERSION_NUMBER
  - P_FINPLAN_TYPE_ID
  - P_FINPLAN_TYPE_NAME

  If P_BUDGET_VERSION_ID is populated, then the other four parameters are ignored.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_API_VERSION_NUMBER
- P_PM_PRODUCT_CODE
- P_PROJECT_ID (conditional -- see Business Rules)
- P_PM_PROJECT_REFERENCE (conditional -- see Business Rules)
- P_UPDATE_PLAN_TYPE
- P_STRUCTURE_VERSION_ID (conditional -- see Business Rules)
- P_BUDGET_VERSION_ID (conditional -- see Business Rules)
- P_BUDGET_VERSION_NUMBER (conditional -- see Business Rules)
- P_VERSION_TYPE (conditional -- see Business Rules)
- P_FINPLAN_TYPE_ID (conditional -- see Business Rules)
- P_FINPLAN_TYPE_NAME (conditional -- see Business Rules)

Status APIs

Use your external system to calculate and monitor the progress of your project in terms of earned value and percentage complete. Then use the status APIs to report project status inquiry (and billing, if required) to Oracle Projects.

Note: Project status inquiry does not report budgets created using financial plan types. Consequently, the status APIs and views related to budgeting and forecasting listed below only report and process budgets and forecasts created using budget types.

Using the status views described in this section, you can display actual and budgeted amounts in various formats:

- GL period
- PA period
- Work breakdown structure
- Resource
- Burden components

Overview of Status API Views

At the resource level, labor hours (not quantities) are summarized for resources that are tracked as labor. To determine if a resource tracks labor hours but not quantities, join the RESOURCE_LIST_MEMBER_ID to the PA_RESOURCE_LIST_V for the TRACK_AS_LABOR_FLAG column. If TRACK_AS_LABOR_FLAG is Y, the column tracks only labor hours for the resource. Otherwise, quantities are summarized.

For higher-level project and task-level views, the labor hour and quantity summarization rules mentioned above also apply. For example, a project-level labor resource with a TRACK_AS_LABOR_FLAG of Y may show summarized inception-to-date costs, revenues, budgets, and labor hours, but not quantities.

This method of tracking labor hours and quantities has its roots in the way *predefined resources* are summarized in Oracle Projects. All resources in Oracle Projects can be defined as a combination of one or more predefined resources. Predefined resources have three summarization attributes:

- Unit of measure
- Track as labor
- Roll-up actual quantity

The values for the summarization attributes are hard-coded in a view that is used for mapping actuals to resources. The client can change the values by changing the view. The logic of the view is outlined in the two following tables. The following table shows the logic of the view as it relates to predefined resource types.

Predefined Resource Type	Track as Labor	Unit of Measure	Rollup Actual Quantity
Employee	Yes	Hours	No
Job	Yes	Hours	No
Organization	Yes	Hours	No
Expenditure Type	Depends on the expenditure type attribute with track as labor	Unit of measure specified for the expenditure type	Yes
Event Type	No	blank	No
Supplier	No	blank	No
Expenditure Category	Depends whether the expenditure category includes a labor expenditure type	Depends whether the resource type is tracked as labor	No
Revenue Category	Depends whether the revenue category includes a labor expenditure type	Depends whether the resource type is tracked as labor	No

The following table shows the logic of the view as it relates to predefined resources.

Predefined Resource	Track as Labor	Unit of Measure	Rollup Actual Quantity
Uncategorized	Yes	Hours	No
Unclassified	No	blank	No

By defining the uncategorized resource as tracking labor, the client can budget labor hours when entering the uncategorized budget.

To facilitate conditional labor hour and quantity queries on resources, TRACK_AS_LABOR_FLAG is also maintained in the resource member list table. You can query TRACK_AS_LABOR_FLAG column via the PA_RESOURCE_LIST_V view.

To write a select statement on a project-level resource view, you can write a SQL statement similar to the following to conditionally return either labor hours or quantities by resource:

```
SELECT rl.resource_alias List
, decode(rl.resource_track_as_labor_flag,'Y',
ara.actuals_labor_hours_itd,
'N', ara.actuals_quantity_itd, 0) Units
, ara.actuals_labor_hours_itd Hours
, ara.actuals_quantity_itd Qty
FROM pa_resource_list_v rl
, pa_accum_rsrc_act_v ara
WHERE ara.resource_list_member_id =
rl.resource_list_member_id
AND rl.resource_list_id = 1000
AND ara.project_id = 1043
AND ara.task_id = 0
```

Although the resource list identification code, project identification code, and retrieved data vary by database, the select statement above should return values similar to those shown in the following table:

List	Units	Hours	Quantity
Labor	406	406	0
Senior.Consultant	40	40	0
Principal.Consultant	122	122	0
Senior.Engineer	164	164	0
Principal.Engineer	80	80	0
Travel	4372	0	4372
Air Travel	3762	0	3762
Personal Auto Use	105	0	105
In-House Recoverables	222	0	222
Computer Services	62	0	62
Automobile Rental	50	0	50
Meals	125	0	125

List	Units	Hours	Quantity
Other Asset	160	0	160
Other Expenses	225	0	225
Lodging	330	0	330
Other Expenses	225	0	225

Status API Views

The following table lists the views that provide parameter data for the status APIs. For detailed description of the views, refer to Oracle eTRM, which is available on Oracle *MetaLink*.

View	Description
PA_ACCUM_CMT_TXNS_V	Retrieves project-, task-, and resource-related commitments. These commitments include line attributes such as commitment number, dates, expenditure type, and expenditure organization. This view retrieves three major sets of project-related commitments: project level commitments (TASK_ID and RESOURCE_LIST_MEMBER_ID are zero), project-task level commitments (RESOURCE_LIST_MEMBER_ID is zero), and project-task-resource level commitments.
PA_ACCUM_RSRC_ACT_V	Returns current project- and task-level resource actual cost and revenue summary amounts by the following periods: inception-to-date, year-to-date, prior period, and period-to-date
PA_ACCUM_RSRC_CMT_V	Returns current project- and task-level resource commitment summary amounts by the following periods: inception-to-date, year-to-date, prior period, and period-to-date

View	Description
PA_ACCUM_RSRC_COST_BGT_V	Returns project- and task-level resource cost budget summary amounts for the following periods: inception-to-date, year-to-date, prior period, period-to-date, and total
PA_ACCUM_RSRC_REV_BGT_V	Returns project- and task-level resource revenue budget summary amounts for the following periods: inception-to-date, year-to-date, prior period, period-to-date, and total
PA_ACCUM_WBS_ACT_V	Returns current project- and task-level actual cost and revenue summary amounts by the following periods: inception-to-date, year-to-date, prior period, and period-to-date
PA_ACCUM_WBS_CMT_V	Returns current project- and task-level commitment summary amounts by the following periods: inception-to-date, year-to-date, prior period, and period-to-date
PA_ACCUM_WBS_COST_BGT_V	Returns project- and task-level cost budget summary amounts for the following periods: inception-to-date, year-to-date, prior period, period-to-date, and total
PA_ACCUM_WBS_REV_BGT_V	Returns project- and task-level revenue budget summary amounts for the following periods: inception-to-date, year-to-date, prior period, period-to-date, and total
PA_ACT_BY_GL_PERIOD_V	Returns actual cost and revenue totals for lowest tasks and resources by GL periods
PA_ACT_BY_PA_PERIOD_V	Returns actual cost and revenue totals for lowest tasks and resources by PA periods
PA_BURDEN_COMPONENT_CMT_V	Returns commitment burden components by resource, PA period name, expenditure type, expenditure organization, and burden set for each transaction summarization record

View	Description
PA_BURDEN_COMPONENT_COST_V	Returns actual burden components by resource, PA period name, expenditure type, expenditure organization, and burden set for each transaction summarization record. This view returns burden cost components only for resources that have been burdened.
PA_CMT_BY_GL_PERIOD_V	Returns current commitment totals for lowest tasks and resources by GL period.
PA_CMT_BY_PA_PERIOD_V	Returns current commitment totals for lowest tasks and resources by PA periods
PA_GL_PERIODS_V	A view of the PA_PERIODS tables for GL periods and their start and end dates
PA_PA_PERIODS_V	A view of the PA_PERIODS tables for PA periods and their start and end dates
PA_PM_REFERENCE_V	Retrieves Oracle Projects identifiers and reference codes from your external systems for projects and tasks
PA_TASK_ASSIGNMENTS_AMG_V	Retrieves information about all valid task assignment progress for the organization associated with the user's responsibility.
PA_TASK_PROGRESS_AMG_V	Retrieves information about all valid task progress for the organization associated with the user's responsibility.
PA_TXN_ACCUM_V	Shows detail information by various transaction attributes. Transaction attributes can include person, job, organization, vendor, expenditure type, event type, non-labor resource, expenditure category, revenue category, non-labor resource organization, event type classification, system linkage function, and week ending date.

Status API Procedures

The procedures discussed in this section are listed below. The procedures are located in

the public API package PA_STATUS_PUB.

- Update Procedures
  - UPDATE_EARNED_VALUE, page 6-83
  - UPDATE_PROGRESS, page 6-84
- Load-Execute-Fetch Procedures
  - LOAD_TASK_PROGRESS, page 6-86
  - EXECUTE_UPDATE_TASK_PROGRESS, page 6-86
  - INIT_UPDATE_TASK_PROGRESS, page 6-87

Record and Table Datatypes

The record and table datatype used in the APIs is defined on the following pages.

PA_TASK_PROGRESS_LIST_REC_TYPE Datatype

The following table shows the PA_TASK_PROGRESS_LIST_REC_TYPE datatype.

Name	Type	Required?	Description
TASK_ID	NUMBER	Yes, if PM_TASK_REFERENCE is not provided	The reference code that uniquely identifies the task within a project in Oracle Projects.
TASK_NAME	VARCHAR2 (20)	No	Task name
TASK_NUMBER	VARCHAR2 (25)	No	The element number or task number of the task
PM_TASK_REFERENCE	VARCHAR2 (250)	Yes, if TASK_ID is not provided	The reference code that uniquely identifies the structure or task in the external system.
PERCENT_COMPLETE	NUMBER	Yes	The percent complete of the object
DESCRIPTION	VARCHAR2 (250)	No	The progress overview or description

Name	Type	Required?	Description
OBJECT_ID	NUMBER	Yes	The project element ID of the structure, task, or deliverable, or the resource list member ID of the assignment in Oracle Projects
OBJECT_VERSION_ID	NUMBER	Yes	The element version ID of the task or deliverable
OBJECT_TYPE	VARCHAR2 (30)	Yes	The object type: PA_STRUCTURES for project level progress; PA_TASKS for task level progress; PA_ASSIGNMENTS for assignment level progress; PA_DELIVERABLES for deliverable level progress
PROGRESS_STATUS_CODE	VARCHAR2 (150)	Yes	Progress status code
PROGRESS_COMMENT	VARCHAR2 (4000)	No	Progress comments
ACTUAL_START_DATE	DATE	No	Actual start date
ACTUAL_FINISH_DATE	DATE	No	Actual finish date
ESTIMATED_START_DATE	DATE	No	Estimated start date
ESTIMATED_FINISH_DATE	DATE	No	Estimated finish date
SCHEDULED_START_DATE	DATE	No	Scheduled start date
SCHEDULED_FINISH_DATE	DATE	No	Scheduled finish date
TASK_STATUS	VARCHAR2 (150)	Yes	The task status code or deliverable status code

Name	Type	Required?	Description
EST_REMAINING_EFFORT	NUMBER	No	The estimate to complete effort
ACTUAL_WORK_QUANTITY	NUMBER	No	Actual work quantity; applies only at the lowest level tasks
LOWEST_LEVEL_TASK	VARCHAR2 (1)		For internal use only
PROGRESS_MODE	VARCHAR2 (30)		For internal use only
ETC_COST	NUMBER	No	Estimate to complete cost
PM_DELIVERABLE_REFERENCE	VARCHAR2 (150)	No	Deliverable reference
PM_TASK_ASSIGN_REFERENCE	VARCHAR2 (150)	No	Task assignment reference
ACTUAL_COST_TO_DATE	NUMBER	No	The cumulative actual cost in transaction currency
ACTUAL_EFFORT_TO_DATE	NUMBER	No	The cumulative actual effort

Required Parameters and Parameter Values

The following tables shows the parameters that are required when you use the UPDATE_PROGRESS and LOAD_TASK PROGRESS APIs to update progress information for projects, tasks, assignments, and deliverables.

Parameters Required for Projects

The following table shows the parameters that are required when you use the UPDATE_PROGRESS and LOAD_TASK PROGRESS APIs to update progress information for projects.

Parameter Name	Comment
P_PROJECT_ID	Required if P_PM_PROJECT_REFERENCE is not provided
P_PM_PROJECT_REFERENCE	Required if P_PM_PROJECT_ID is not provided
P_PM_PRODUCT_CODE	
P_PM_STRUCTURE_TYPE	
P_AS_OF_DATE	
P_TASK_ID	Value = 0
P_PM_TASK_REFERENCE	Required if P_TASK_ID is not provided
P_OBJECT_ID	Value = STRUCTURE ID
P_OBJECT_VERSION_ID	Value = STRUCTURE VERSION ID
P_OBJECT_TYPE	Value = PA_STRUCTURES
P_PROGRESS_STATUS_CODE	
P_TASK_STATUS	

Parameters Required for Tasks

The following table shows the parameters that are required when you use the UPDATE_PROGRESS and LOAD_TASK PROGRESS APIs to update progress information for tasks.

Parameter Name	Comment
P_PROJECT_ID	Required if P_PM_PROJECT_REFERENCE is not provided
P_PM_PROJECT_REFERENCE	Required if P_PM_PROJECT_ID is not provided

Parameter Name	Comment
P_PM_PRODUCT_CODE	
P_PM_STRUCTURE_TYPE	
P_AS_OF_DATE	
P_TASK_ID	Required if P_PM_TASK_REFERENCE is not provided
P_PM_TASK_REFERENCE	Required if P_TASK_ID is not provided
P_OBJECT_ID	Value = TASK ID
P_OBJECT_VERSION_ID	Value = TASK VERSION ID
P_OBJECT_TYPE	Value = PA_TASKS
P_PROGRESS_STATUS_CODE	
P_TASK_STATUS	

Parameters Required for Assignments

The following table shows the parameters that are required when you use the UPDATE_PROGRESS and LOAD_TASK PROGRESS APIs to update progress information for assignments.

Parameter Name	Comment
P_PROJECT_ID	Required if P_PM_PROJECT_REFERENCE is not provided
P_PM_PROJECT_REFERENCE	Required if P_PM_PROJECT_ID is not provided
P_PM_PRODUCT_CODE	
P_PM_STRUCTURE_TYPE	

Parameter Name	Comment
P_AS_OF_DATE	
P_TASK_ID	Required if P_PM_TASK_REFERENCE is not provided
P_PM_TASK_REFERENCE	Required if P_TASK_ID is not provided
P_OBJECT_ID	Value = RESOURCE LIST MEMBER ID
P_OBJECT_VERSION_ID	Value = RESOURCE LIST MEMBER VERSION ID
P_OBJECT_TYPE	Value = PA_ASSIGNMENTS
P_PROGRESS_STATUS_CODE	
P_TASK_STATUS	

Parameters Required for Deliverables

The following table shows the parameters that are required when you use the UPDATE_PROGRESS and LOAD_TASK PROGRESS APIs to update progress information for deliverables.

Parameter Name	Comment
P_PROJECT_ID	Required if P_PM_PROJECT_REFERENCE is not provided
P_PM_PROJECT_REFERENCE	Required if P_PM_PROJECT_ID is not provided
P_PM_PRODUCT_CODE	
P_PM_STRUCTURE_TYPE	
P_AS_OF_DATE	

Parameter Name	Comment
P_TASK_ID	Required if P_PM_TASK_REFERENCE is not provided
P_PM_TASK_REFERENCE	Required if P_TASK_ID is not provided
P_OBJECT_ID	Value = DELIVERABLE ID
P_OBJECT_VERSION_ID	Value = DELIVERABLE VERSION ID
P_OBJECT_TYPE	Value = PA_DELIVERABLES
P_PROGRESS_STATUS_CODE	
P_TASK_STATUS	

Related Topics

UPDATE_PROGRESS, page 6-84

LOAD_TASK_PROGRESS, page 6-86

Status API Procedure Definitions

This section contains descriptions of the status APIs.

UPDATE_EARNED_VALUE

UPDATE_EARNED_VALUE is a PL/SQL procedure that updates earned value information in the PA_EARNED_VALUES tablefor lowest task-resource combinations. You can also use this procedure to update project-task rows.

This procedure creates a new row in the table PA_EARNED_VALUES. CURRENT_FLAG is always set to Y for the last row inserted for each project, task, and resource combination. CURRENT_FLAG for all other rows is set to N.

To create a project-task row, pass zero for the RESOURCE_LIST_MEMBER_ID parameter. To create a project row, pass zero for both the TASK_ID and RESOURCE_LIST_MEMBER_ID parameters.

> **Note:** This API assumes that the vendor of the external system maintains the appropriate earned value data for all levels in any given

project.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for UPDATE_EARNED_VALUE are listed below:

- P_API_VERSION_NUMBER
- P_PROJECT_ID
- P_TASK_ID
- P_RESOURCE_LIST_MEMBER_ID
- P_AS_OF_DATE
- P_BCWS_ITD
- P_ACWP_ITD
- P_BCWP_ITD
- P_BAC_ITD ITD
- P_BQWS_ITD
- P_AQWP_ITD
- P_BQWP_ITD
- P_BAQ_ITD

UPDATE_PROGRESS

UPDATE_PROGRESS is a PL/SQL procedure that updates progress information in the PA_PERCENT_COMPLETES table as of a given date forall levels of the work breakdown structure.

For a given project, a task identifier of zero shows that the parameters apply to a project-level row. A task identifier greater than zero shows that the parameters apply to a task-level row.

Adding tasks from a project's work breakdown structure does not affect their corresponding rows in the PA_PERCENT_COMPLETES table. When executed, this API inserts a new row in the PA_PERCENT_COMPLETES table if a row for that project-task combination does not already exist.

Business Rules

This procedure creates a new row in the table PA_PERCENT_COMPLETES. CURRENT_FLAG is always set to Y for the last row inserted for each project, task, and resource combination. CURRENT_FLAG for all other rows is set to N.

To create a project row, you must pass zero in TASK_ID.

> **Note:** This API assumes that vendor of the external system maintains the appropriate rollup of progress data for each level of the work breakdown structure for any given project. Providing progress information, however, is optional.

> **Note:** See "Status API Parameters", page 6-79, for additional information about whether parameters are required when updating progress information for projects, tasks, assignments, or deliverables.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for UPDATE_PROGRESS are listed below:

- P_API_VERSION_NUMBER
- P_PROJECT_ID (if P_PM_PROJECT_REFERENCE is not provided)
- P_PM_PROJECT_REFERENCE (if P_PM_PROJECT_ID is not provided)
- P_PM_PRODUCT_CODE
- P_PM_STRUCTURE_TYPE
- P_AS_OF_DATE
- P_TASK_ID (if P_PM_TASK_REFERENCE is not provided)
- P_PM_TASK_REFERENCE (if P_TASK_ID is not provided)
- P_PERCENT_COMPLETE
- P_OBJECT_ID
- P_OBJECT_VERSION_ID
- P_OBJECT_TYPE
- P_PROGRESS_STATUS_CODE

- P_TASK_STATUS

LOAD_TASK_PROGRESS

LOAD_TASK_PROGRESS is a Load-Execute-Fetch PL/SQL procedure used to load progress information in the pl/sql data structures.

> **Note:** See "Status API Parameters", page 6-79, for additional information about whether parameters are required when updating progress information for projects, tasks, assignments, or deliverables.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for LOAD_TASK_PROGRESS are listed below:

- P_API_VERSION_NUMBER
- P_PROJECT_ID (if P_PM_PROJECT_REFERENCE is not provided)
- P_PM_PROJECT_REFERENCE (if P_PM_PROJECT_ID is not provided)
- P_PM_PRODUCT_CODE
- P_PM_STRUCTURE_TYPE
- P_AS_OF_DATE
- P_TASK_ID (if P_PM_TASK_REFERENCE is not provided)
- P_PM_TASK_REFERENCE (if P_TASK_ID is not provided)
- P_PERCENT_COMPLETE
- P_OBJECT_ID
- P_OBJECT_VERSION_ID
- P_OBJECT_TYPE
- P_PROGRESS_STATUS_CODE
- P_TASK_STATUS

EXECUTE_UPDATE_TASK_PROGRESS

EXECUTE_UPDATE_TASK_PROGRESS is a Load-Execute-Fetch PL/SQL procedure used to update progress information in Oracle Projects.

This procedure creates a new row in the table PA_PERCENT_COMPLETES. CURRENT_FLAG is always set to Y for the last row inserted for each project, task, and resource combination. CURRENT_FLAG for all other rows is set to N.

To create a project row, you must pass zero in TASK_ID.

> **Note:** This API assumes that vendor of the external system maintains the appropriate rollup of progress data for each level of the work breakdown structure for any given project. Providing progress information, however, is optional.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for EXECUTE_UPDATE_TASK_PROGRESS are listed below:

- P_API_VERSION_NUMBER

INIT_UPDATE_TASK_PROGRESS

INIT_UPDATE_TASK_PROGRESS is a utility used to initialize internal PL/SQL tables. It is recommended to call this API before every call to the EXECUTE_UPDATE_TASK_PROGRESS API.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for INIT_UPDATE_TASK_PROGRESS are listed below:

- P_API_VERSION_NUMBER

Custom Summarization Reporting APIs

The Custom Summarization Reporting APIs give you added control for custom summarization reporting.

Actuals Summarization API

You can use the Actuals Summarization API to retrieve amounts for a single period or a range of periods for either Oracle Projects or Oracle General Ledger periods. You can retrieve actual cost, revenue, and commitment amounts.

To obtain an understanding of how this API can be used for reporting, refer to the descriptions of the following Oracle Projects reports in the *Oracle Projects Fundamentals* guide:

- Revenue, Cost, Budgets by Resources (Project Level)

- Task - Revenue, Cost, Budgets by Resources

The Actuals Summarization API package name is *pa_accum_api.* The corresponding file names are as follows:

- Body file: PAAAPIB.pls
- Specification file: PAAAPIS.pls

The Actuals Summarization API includes the following procedures:

- GET_PROJECT_ACCUM_ACTUALS, page 6-88
- GET_PROJ_RES_ACCUM, page 6-88
- GET_PROJ_TXN_ACCUM, page 6-89

Actuals Summarization API Procedures

You can view descriptions of all of the parameters for the following procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

GET_PROJECT_ACCUM_ACTUALS

This is the primary procedure for retrieving actual cost, revenue, and commitment amounts at a project level.

The required parameters for GET_PROJECT_ACCUM_ACTUALS are listed below:

- x_project_id
- x_from_period_name

> **Important:** If a value is passed to this procedure for the parameter x_resource_list_member_id while retrieving aggregate project or task amounts, then the procedure calls the GET_PROJ_RES_ACCUM procedure. If no value is passed for the parameter x_resource_list_member_id, then this procedure calls the GET_PROJ_TXN_ACCUM procedure.

GET_PROJ_RES_ACCUM

This procedure retrieves actual cost, revenue, and commitment amounts for the resource named in the parameter *x_resource_list_member_id* for the procedure GET_PROJECT_ACCUM_ACTUALS.

The required parameters for this procedure are listed below:

- x_project_id

- x_from_period_name
- x_resource_list_member_id

GET_PROJ_TXN_ACCUM

This procedure retrieves summarized amounts for the various transaction types such as cost, revenue and commitment.

The required parameters for this procedure are listed below:

- x_project_id
- x_from_period_name

Budget Summarization API

You can use the Budget Summarization API for custom reporting. This API gets budget data for any budget baseline. You can get the budget data without running the Update Project Summary process.

> **Note:** The Budget Summarization API does not support budgets created using financial plan types.

This API returns budget amounts by:

- Project, task, and resource combinations
- All levels of the project work breakdown structure
- All levels of the resource breakdown structure
- Oracle Projects or Oracle General Ledger period
- Oracle Projects or Oracle General Ledger period ranges
- Budget type

The Budget Summarization API can return summary amounts for budgets assigned to any level of the project and task work breakdown structure, providing you pass the TASK_ID corresponding to the budgeted level. For example, if a project is budgeted at the top task and you pass a lower task to the Budget Summarization API, the API will return zero budget amounts.

The name of the summarization package is *pa_accum_api* and the name of the budget procedure is *get_proj_accum_budgets*.

Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Project Performance Reporting APIs

The Project Performance Reporting APIs enable you to summarize base summary data for resources across projects without navigating to the resource summary or resource analysis pages for each project. You can then analyze the resource summary amounts for multiple projects to create your own custom reports. When you no longer require the data, Oracle Projects recommends that you use the Project Performance Reporting APIs to delete the resource rollup summary amounts that you created and improve system performance

The Project Performance Reporting API package name is pji_perf_rptg_pub. The corresponding file names are as follows:

- Body file: PJIPRFPB.pls
- Specification file: PJIPRFPS.pls

The Project Performance Reporting API includes the following procedures:

- CREATE_RESOURCE_ROLLUP, page 6-90
- DELETE_RESOURCE_ROLLUP, page 6-91

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

CREATE_RESOURCE_ROLLUP

This procedure inserts header information for the specified projects and structures in the PJI_ROLLUP_LEVEL_STATUS table and the corresponding rollup resource summary amount details in the PJI_FP_XBS_ACCUM_F table.

The following CREATE_RESOURCE_ROLLUP parameters are required:

- P_API_VERSION_NUMBER
- P_COMMIT
- P_INIT_MSG_LIST
- P_PROJECT_ID

- P_PLAN_VERSION_ID_TBL
- P_RBS_VERSION_ID_TBL
- P_PRG_ROLLUP_FLAG
- X_MSG_COUNT
- X_MSG_DATA
- X_RETURN_STATUS

DELETE_RESOURCE_ROLLUP

This procedure deletes header information for the specified projects and structures from the PJI_ROLLUP_LEVEL_STATUS table and the corresponding rollup resource summary amount details from the PJI_FP_XBS_ACCUM_F table.

The following DELETE_RESOURCE_ROLLUP parameters are required:

- P_API_VERSION_NUMBER
- P_COMMIT
- P_INIT_MSG_LIST
- P_PROJECT_ID
- X_MSG_COUNT
- X_MSG_DATA
- X_RETURN_STATUS

Part 3

ORACLE PROJECTS CLIENT EXTENSIONS

7

Overview of Client Extensions

This chapter describes everything you need to know about designing and writing client extensions in Oracle Projects.

This chapter covers the following topics:

- Client Extensions
- Implementing Client Extensions

Client Extensions

You can use client extensions to extend the functionality of Oracle Projects. You can automate your company's business rules within the standard processing flow of Oracle Projects, without having to customize the software.

The package specification and body (template procedure) files are stored in the Oracle Projects patch/115/sql directory. You use PL/SQL to modify procedures within the extensions. Oracle Projects calls these procedures during specific points in the standard processing.

The procedures that you write are *extensions*, not *customizations*. Extensions are supported features within the product and are easily upgraded between product releases. Customizations are changes to the base product which are not supported and are not easily upgraded.

> **Warning:** Do not insert or update records directly into any Oracle Applications table; using extensions to do so is not supported by Oracle. You must use the public, predefined procedures that Oracle Projects provides to insert or update records in Oracle Projects tables. You are responsible for the support and upgrade of the procedures that you write that are affected by changes between releases of Oracle Applications.

Implementing Client Extensions

To implement client extensions, you must analyze your business requirements, design the client extension logic, and then write the appropriate PL/SQL procedures. Each of these steps is described in this section.

Each step requires a specific expertise. The analysis and design portions require an implementation team member who knows company's business rules, how Oracle Projects is set up in your company, and how you want to use the client extensions. The PL/SQL coding portion requires a team member who is adept with PL/SQL and the Oracle Projects data structures. Typically, the implementation team includes two or more people working together to provide the necessary expertise.

Related Topics

Analyzing Your Business Requirements, page 7-2

Designing the Logic, page 7-2

Writing PL/SQL Procedures, page 7-4

Analyzing Your Business Requirements

First determine if you need to use client extensions at all.

1. Define and document your company's business requirements and rules.
2. Determine if these business rules are handled by the standard features of Oracle Projects.
3. For those business rules not handled by the standard functionality, determine which client extensions can address your specific business needs.

Example of Business Requirements Analysis

Your company has defined a policy that supplies must be charged to overhead projects.

You review your implementation of Oracle Projects and find that you can use transaction controls to specify what can be charged to a specific project or task. The rule regarding supplies is applicable to all projects that are not overhead projects. You decide it is impractical to implement this rule by defining transaction controls for every non-overhead project.

You decide to use transaction control extensions to implement this policy.

Designing the Logic

Careful design is critical. If you create careful, thorough design and specifications in this

stage, you can expect more ease in writing the PL/SQL procedure and a more successful client extension implementation. This design cycle includes the following steps:

1. Understand the client extensions you propose to use, including their purpose, processing flow, when Oracle Projects calls the extensions, and the input values.

2. Define and document the requirements and logic of your business rules under all possible conditions. Determine the inputs, calculations performed, and resulting outputs.

3. Determine the data elements required to enforce your rules and how you will select or derive each of the required elements. Define additional implementation data and document additional business procedures based on the requirements of your business rules.

4. Step through various business scenarios to ensure that your logic handles each condition as you expect. You can use these scenarios as test cases when you test your actual client extension definition and procedure.

5. Give the detailed specification to the team member who will write the PL/SQL procedure.

   Note: If you want to use different logic for different parts of your enterprise, write one procedure that branches appropriately.

Determining Data Elements

Each client extension contains predefined parameters. The program that calls and executes the client extension passes in values for the predefined parameters.

You can derive additional parameters from the predefined parameters. For example, if a client extension has a predefined parameter of PROJECT_ID (project identifier), you can derive the project type from PROJECT_ID.

You can also use descriptive flexfield segments to hold additional data as inputs to your rules. When you write the PL/SQL procedure, you select from the descriptive flexfield segment column that holds the appropriate input value.

You can derive data for any Oracle table as input into your rules, as long as you can derive the values from the predefined input values passed into the PL/SQL procedure.

Example: Designing a Client Extension

Let's use our earlier transaction control extension example to illustrate these design steps. (See: Analyzing Your Business Requirements, page 7-2.)

1. After studying transaction control extensions, you decide to use the transaction control extensions so that users can charge supplies only to overhead projects.

2. You define the logic for the transaction control extension as:

```
IF charging supplies
   THEN IF  charging to overhead projects
    THEN  OK
    ELSE  error message
   You can charge supplies only to overhead projects
   ELSE OK
```

3. You determine the data elements that identify which transactions are supplies and which projects are overhead projects.

   You decide that the expenditure type of *Supplies* specifies the type of charge, and that the project type of *Overhead* specifies the type of project.

   The predefined parameters for the extension include expenditure type (*Supplies*) and project ID. You can derive the project type (*Overhead*) from the project ID.

   The logic is:

```
IF Expenditure Type = Supplies
THEN IF Project Type = Overhead
  THEN  OK
  ELSE  error message
You can charge supplies only to overhead projects
ELSE OK
```

4. You step through several scenarios using different types of charges and different types of projects. Your logic handles all of the scenarios.

5. You are ready to hand off this specification to your technical resource.

Writing PL/SQL Procedures

This section is a brief overview of PL/SQL procedures. For more information, see: *PL/SQL User's Guide and Reference Manual*.

> **Note:** We recommend that you keep the *PL/SQL User's Guide and Reference Manual* on hand as reference material while defining procedures. In addition, you can refer to the Oracle eTechnical Reference Manuals (eTRM) for detailed description of database tables and views. Oracle eTRM is available on *OracleMetaLink*.

Packages

Packages are database objects that group logically related PL/SQL types, objects, and subprograms. Packages usually consist of two files: a package specification file and a package body file. The files are described below:

Package Specification File The specification file is the interface to your applications. It declares the types, variables, constants, exceptions, cursors,

and subprograms available for use in the package.

In Oracle Projects client extensions, this file contains the package name, procedures, and function declarations. If you create procedures within the package outside the predefined procedure, you must also modify this file.

Package Body File

The package body contains the actual PL/SQL code used to implement the business logic.

In Oracle Projects client extensions, this file contains the procedure or procedures that you modify to implement the extension. You can define as many procedures as you like within the package or within the predefined procedure or procedures.

Warning: Do not change the name of the extension procedures. In addition, do not change the parameter names, parameter types, or parameter order in your procedure.

Tip: After you write a procedure, do not forget to compile it and store it in the database.

Procedures

Procedures are subprograms within a package. Procedures are invoked by the application and perform a specific action. Procedures define what parameters will be passed in as context for the program, how the inputs are processed, and what output is returned. A procedure consists of the following elements:

Inputs

Each procedure has predefined input parameters, which must be passed in the predefined order. The parameters identify the transaction being processed and the context in which the program is called. You can derive additional inputs from any Oracle table based on the predefined input parameters.

Logic

The procedure uses the inputs and performs any logical processing and calculations. The program can be a simple program, such that it returns a fixed number, or it can be a complex algorithm that performs multiple functions.

Outputs

Each procedure returns whatever value you define it to return. For example, your procedure for transaction control extensions could return a null value if the transaction passes all validation rules, or an error message if validation

fails.

Syntax

A procedure consists of two parts: the *specification* and the *body*.

The procedure specification begins with the keyword PROCEDURE and ends with the procedure name or a parameter list.

The procedure body begins with the keyword IS and ends with the keyword END, followed by an optional procedure name. The procedure body has a declarative part, an executable part, and an optional error handling part.

You write procedures using the following syntax:

```
PROCEDURE name [  (parameter [, parameter,...])  ] IS
  [local declarations]
BEGIN
  executable statements
[EXCEPTION
exception handlers]
END [name];
```

The parameter syntax above expands to the following syntax:

```
var_name [IN | OUT NOCOPY | IN OUT NOCOPY] datatype [{:= | DEFAULT}
value]
```

For more information, refer to the *PL/SQL User's Guide and Reference Manual*.

Using Template Procedures

Oracle Projects provides template procedures for each client extension that you can use to write your own procedures. Each template procedure contains predefined parameters that are passed into the procedure by the program that calls the procedure; you cannot change these predefined input parameters.

The template procedure files are stored in the Oracle Projects patch/115/sql directory.

Review the appropriate files before you design and implement a client extension. They provide a lot of useful information, including the predefined input parameter list and example case studies.

Make copies of these template files in a directory used by your company to store code that you have written, and then modify the copies. These template files will be replaced when the software is upgraded between releases. Use your modified files to reinstall your procedures after an upgrade to a new release of Oracle Projects.

Writing Logic in PL/SQL Procedures

You write the logic in the PL/SQL procedures based on the functional specifications created during the design process. Before you write the client extension PL/SQL procedures, you should have a clear understanding of the client extension procedures; including the inputs and outputs, error handling, and any example procedures

provided for each extension. Read the appropriate client extension essays and template procedures to obtain detailed information.

> **Note:** Do not commit data within your PL/SQL procedure. Oracle Projects processes that call your procedures handle the commit logic.

Compiling and Storing Your Procedures

After you write your procedures and ensure that the specification file correctly includes any procedures that you have defined, compile and store the procedures in the database in the Applications Oracle user name. Install the package specification first, and then install the package body.

The template procedure files include syntax for compiling and storing the PL/SQL procedures. Assuming you have written your procedures using copies of the template procedure files, change to the directory in which your files are stored (use the command that is appropriate to your operating system):

```
$ sqlplus <apps user name>/<apps password>
SQL> @<spec_filename>.pls
SQL> @<body_filename>.pls
```

For example, if your Oracle Applications Oracle user name/password is apps/apps, you could use the following commands to install your transaction control extensions:

```
$ sqlplus apps/apps
SQL> @PAXTTXCS.pls
SQL> @PAXTTXCB.pls
```

If you encounter errors when you are creating your packages and its procedures, correct the errors and recreate your packages. You must successfully compile and store your package and its procedures in the database before you can use the client extensions in Oracle Projects.

Testing Your Procedures

After you have created your client extension procedures, test your client extension definitions within the processing flow of Oracle Projects to verify that you get the expected results.

8

Oracle Project Foundation Client Extensions

This chapter describes the client extensions in the Oracle Project Foundation application.

This chapter covers the following topics:

- Project Security Extension
- Project Verification Extension
- Project and Task Date Extension
- Project Workflow Extension
- Verify Organization Change Extension
- Transaction Import Extensions
- Descriptive Flexfield Mapping Extension
- Archive Project Validation Extension
- Archive Custom Tables Extension

Project Security Extension

Oracle Projects provides a client extension, PA_SECURITY_EXTN, that enables you to override the default project-based security and implement your own business rules for project and labor cost security. For more information on project-based security, see Security in Oracle Projects, *Oracle Projects Fundamentals*. This extension applies only to Oracle Projects windows and not to reports. Some examples of rules that you may define are:

- Only users who belong to the same organization as the project organization can access the project (organization-based security). Sample code for this example is included in the client extension package.

- All project administrators can view and update projects to which they are assigned, but project managers can only view those projects to which they are assigned

- Some responsibilities can view or update only capital projects (for an environment where users who handle capital projects do not handle contract and indirect projects)

Considerations for Project Security Extension Logic

You should determine the logic and the additional data elements your client extension requires before you write it. We recommend that you consider the following design issues for the project security extension:

- What are the conditions or circumstances in which project or labor security is based? What types of users? How will you identify the users? What types of projects? How will you identify the projects?
- Do you want the users to view the project but not update it, or do you want to block the project from their online queries?
- Does the type of security for a given user or set of projects change depending on the module?
- How does project security interact with the function security defined for the responsibility?
- Consider the performance implications of the logic that you write. The extension is called for every project during online queries.

Writing the Project Security Extension

The extension is identified by the following items:

Item	Name
Body template	PAPSECXB.pls
Specification template	PAPSECXS.pls
Package	pa_security_extn
Procedure	check_project_access

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and

store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

You can view descriptions of the parameters for CHECK_PROJECT_ACCESS in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Additional Information about Parameters

The parameter X_calling_module allows you to write security rules based on the module in which the extension is called. The values are as follows:

Value	Description
PAXBUEBU	Budgets window
PAXCARVW	Capital Projects window
PAXINEAG	Agreements window
PAXINRVW	Invoice Review window
PAXINVPF	Project Funding Inquiry window
PAXPREPR	Projects window
PAXTRAPE.PROJECT	Project Expenditure Inquiry window
PAXURVPS	Project Status Inquiry window

Refer to the PA_Security_Extn procedure for the most up-to-date information about values for X_calling_module.

Project Verification Extension

The Project verification extension contains procedures that enable you to define rules for the following purposes:

- To determine whether a project can change its project status
- To determine whether to call Workflow for a project status change

Processing

Oracle Projects calls the Project Verification Extension when a change of status is requested for a project.

Designing Project Verification Extensions

You must determine what business rules you want to apply when a project status change is selected for a project. See also: Project Statuses, *Oracle Projects Implementation Guide*.

Writing Project Verification Extensions

The extension is identified by the following items:

Item	Name
Body template	PAXPCECB.pls
Specification template	PAXPCECS.pls
Package	pa_client_extn_proj_status

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Verify Project Status Change

The name for this procedure is verify_project_status_change.

Use this procedure to define requirements a project must satisfy to change from one project status to another. Detailed instructions for modifying the procedure are included in the package body.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Check Workflow Enabled

The name for this procedure is check_wf_enabled.

When Oracle Projects determines whether to call Workflow for a project status change, it bases the decision on the settings in the project status record and the project type. You can use this procedure to override those settings and/or add additional requirements.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Project and Task Date Extension

You can customize this client extension to substitute dates used by external systems for the standard Oracle Projects project and task start and completion dates.

Oracle Projects supports the following project tracking dates through the Oracle Projects APIs. When you download a project from an external system, you can pass the values for these dates and store them in Oracle Projects as the project and task start and completion dates.

- Actual start date
- Actual finish date
- Early start date
- Early finish date
- Late start date
- Late finish date
- Scheduled start date
- Scheduled finish date

The extension is identified by the following items:

Item	Name
Body template	PAPMGCEB.pls
Specification template	PAPMGCES.pls
Package	pa_client_extn_pm
Procedure	customize_dates

The template package contains default logic to return the date information that was passed to the API without substituting it for the Oracle Projects project or task start or completion date.

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Customize Dates

The name of the customize dates procedure is pa_client_extn_pm.customize_dates.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

You can customize this client extension to substitute a different set of project and task start dates for the standard Oracle Projects project and task start and completion dates. For example, you can define your own rules to determine which project and task dates in the external system correspond to the project and task start and completion dates in Oracle Projects.

The following code shows how to map the actual start and actual finish dates in an external system to the project and task start and completion dates in Oracle Projects.

> **Note:** The parameters P_OUT_START_DATE and P_OUT_COMPLETION_DATE must return valid values. The public APIs read the values and will not execute properly if the date values are invalid.

```
-- Initialize the out variables
p_error_code := 0;
p_error_stage := NULL;
IF p_actual_start_date IS NOT NULL
and p_actual_finish_date IS NOT NULL
THEN
p_out_start_date := p_actual_start_date;
p_out_finish_date := p_actual_finish_date;
ELSE
p_out_start_date := p_in_start_date;
p_out_completion_date := p_in_completion_date;
END IF;

-- To specify conditions based on different external products
-- whose data you import,
-- use code that looks something like this

IF p_pm_product_code = {your product code} THEN
IF p_actual_start_date IS NOT NULL and
p_actual_finish_date IS NOT NULL THEN
p_out_start_date := p_actual_start_date;
p_out_finish_date := p_actual_finish_date;
ELSE
p_out_start_date := p_in_start_date;
p_out_completion_date := p_in_completion_date;
END IF;
ELSIF p_pm_product_code = {different product code}
IF p_early_start_date IS NOT NULL and
p_early_finish_date IS NOT NULL THEN
p_out_start_date := p_early_start_date;
p_out_finish_date := p_early_finish_date;
ELSE
p_out_start_date := p_in_start_date;
p_out_completion_date := p_in_completion_date;
END IF;
ELSE
p_out_start_date := p_in_start_date;
p_out_completion_date := p_in_completion_date;
END IF;
-- If you want different mappings for projects and tasks
then base your logic on
-- p_pm_task_reference or p_task_id
IF (p_pm_task_reference IS NOT NULL or p_task_id IS
NOT NULL) THEN

-- (this means this is for a task)
-- place the logic for assigning one set of
dates here
ELSE -- ( this means this is for a project)
-- place the logic for assigning a different set
of dates
END IF;
EXCEPTION
WHEN OTHERS THEN
p_error_code := -1;
-- If ORACLE error then set p_error_code to
SQLCODE
-- Handle your exception here
```

Project Workflow Extension

The project workflow extension enables you to customize the workflow processes for changing project statuses.

You must determine how you want to identify the approver for a project status change. See also: Project Statuses: page, *Oracle Projects Implementation Guide*.

Processing

The default project workflow process calls the project workflow extension to determine the project approver.

Writing Project Workflow Extensions

The extension is identified by the following items:

Item	Name
Body template	PAWFPCEB.pls
Specification template	PAWFPCES.pls
Package	pa_client_extn_project_wf

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Procedures

Following are the procedures included in the project workflow extension.

Select Project Approver

The name of this procedures is select_project_approver.

This procedure returns the project approver ID to the calling workflow process. You can modify the procedure to add rules to determine who can approve a project. The default procedure returns the ID of the supervisor of the person who submitted the project status change.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Start Project Workflow

The name of this procedure is start_project_wf.

This procedure starts the workflow process for project status changes.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Verify Organization Change Extension

The Verify Organization Change Extension enables you to build business rules to determine whether an organization change is allowed for a Project/Task Owning Organization, and to define the error messages that are used when the rules are violated.

Processing

Oracle Projects calls the Verify Organization Change Extension during the Mass Update Batches process, and in the Projects window when the project or task owning organization is changed.

Location and Package Name

The extension is identified by the following items:

Item	Name
Body template	PAXORCEB.pls
Specification template	PAXORCES.pls
Package	pa_org_client_extn
Procedure	verify_org_change

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and

store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Verify Organization Change

The name for the verify organization change extension is verify_org_change. This procedure is described below.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Mass Update Batches, *Oracle Projects Fundamentals*

Function Security in Oracle Projects, *Oracle Projects Implementation Guide*

Transaction Import Extensions

Use the Transaction Import Client Extensions to add procedures that run before or after the Transaction Import Process. The Transaction Import Process loads data from other applications into Oracle Projects. You can use the Pre-Import and Post-Import client extensions.

- Use the *Pre-Import Client Extension* to load the Transaction Interface Table (PA_TRANSACTION_INTERFACE_ALL) or to perform pre-import data validation.

- Use the *Post-Import Client Extension* to record the expenditure and expenditure item IDs generated by the Transaction Import Process in the source system. You can also use it for other post-import processing.

The Pre-Import and Post-Import client extensions are called depending upon the Transaction Source that is used in the Transaction Import Process. When you run the Transaction Import Process, you must specify a Transaction Source that determines how the Transaction Import processes the transactions. The Pre-Import and Post-Import client extensions are specified when you set up the transaction source in the Transaction Sources window. The following attributes of the transaction source are used:

- The *Pre Processing Extension* is where you specify the Pre-Import client extension.

- The *Post Processing Extension* is where you specify the Post-Import client extension.

> **Note:** For both the Pre and Post Processing Extensions, you enter the full name of the client extension, including the package, in the

format *package.procedure.*

Each transaction source that you set up can use the same Pre-Import and Post-Import client extensions, or each transaction source can have unique Pre-Import and Post-Import client extensions. For example, if you set up a transaction source for importing data from an external accounts payable system and a different transaction source for importing data from an external time management system, you can create different Pre-Import client extensions for each of the transaction sources or use the same Pre-Import client extension for both transaction sources.

> **Note:** Oracle Projects does not support the use of a Pre-Import client extension or a Post-Import client extension with the *Capitalized Interest* transaction source.

The Oracle Internet Time transaction source that is included with Oracle Projects comes with both a predefined Pre-Import client extension and a Post-Import client extension. These two client extensions are described in the following sections:

Pre-Import Client Extension for Internet Time, page 8-11

Post-Import Client Extension for Internet Time, page 8-13

You may refer to the existing client extensions for Internet Time when you create additional Pre-Import and Post-Import client extensions.

Related Topics

Transaction Import Interface, page 13-25

Transaction Source Options, *Oracle Projects Implementation Guide*

Pre-Import Client Extension for Internet Time

Use the Pre-Import Client Extension for Internet Time to load approved self-service time cards into the Oracle Projects Transaction Interface Table (PA_TRANSACTION_INTERFACE_ALL). Once data is loaded in the transaction interface table, the Transaction Import Process will load the data into Oracle Projects.

This client extension allows you to automate the process of loading Oracle Internet Time data to the interface table as part of the import process.

Oracle Projects calls the Pre-Import Client Extension for Internet Time at the beginning of the Transaction Import Process when you use the Oracle Internet Time transaction source.

If you specify a batch name when you run the Transaction Import Process, the Pre-Import Client Extension for Internet Time loads all data from the Oracle Projects Expenditures table with a matching batch name and with a transfer status code of

Pending. If no batch name is entered, then all records marked as *Pending* are selected for interface.

The Pre-Import Client Extension for Internet Time loads Internet Time data into the interface table without performing any validation. Therefore, only system errors are expected. If a system error does occur, no transfer will take place and all data will remain in the Expenditures table with a status of *Pending*.

If all items are successfully loaded into the transaction interface table, then the Transaction Status Code in the Interface table for all items in the expenditure is set to *Pending*.

> **Note:** If you add validation logic to a custom extension, and the transaction fails the validation, then the Transaction Status Code is set to "Failed Pre" for all items in the expenditure. The failed items will have to be fixed in the external system.

After the last item for an expenditure is successfully loaded into the Transaction Interface Table, then the Transfer Status Code in the Expenditures table is set to *Transferred*.

Description

The extension is identified by the following items:

Item	Name
Body template	PAXTTRXB.pls
Specification template	PAXTTRXS.pls
Package	pa_trx_import
Procedure	pre_import

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Pre-Import Procedure Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of

this manual.

Related Topics

Transaction Import Client Extensions, page 8-10

Transaction Import Interface, page 13-25

Transaction Sources, *Oracle Projects Implementation Guide*

Transaction Source Options, *Oracle Projects Implementation Guide*

Post-Import Client Extension for Internet Time

Use the Post-Import Client Extension for Internet Time to tie back the Oracle Internet Time records that have been imported into Oracle Projects to the source transactions in Oracle Internet Time.

Oracle Projects calls the Post-Import Client Extension for Internet Time after the Transaction Import Process runs when you use the Oracle Internet Time transaction source.

If all items within an expenditure pass through the Post-Import extension successfully, then the Transaction Status Code in the Interface table for all of the items in the expenditure is set to *Accepted*. If any one of the items in the expenditure fails, then the Transaction Status Code for all items in the expenditure is set to *Failed Post*. These records are processedagain the next time the transaction import is run for the batch.

In Internet Time, only system errors are expected during the Post-Import processing. If a system error occurs, then the Transfer Status Code in the Expenditures table will remain *Transferred* and the Transaction Status Code in the Interface table remains *Imported*. They are processed again the next time you run the Post-Import process.

Description

The extension is identified by the following items:

Item	Name
Specification template	PAXTTRXS.pls
Body template	PAXTTRXB.pls
Package	pa_trx_import
Procedures	post_import

Post-Import Procedure Parameters

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Transaction Import Client Extensions, page 8-10

Transaction Import Interface, page 13-25

Transaction Sources, *Oracle Projects Implementation Guide*

Transaction Source Options, *Oracle Projects Implementation Guide*

Descriptive Flexfield Mapping Extension

Use the Descriptive Flexfield Mapping client extension to map segments of descriptive flexfield that are transferred from Oracle Payables to Oracle Projects or from Oracle Projects to Oracle Payables.

To transfer descriptive flexfields between Oracle Projects and Oracle Payables, you must set the *PA: Transfer DFF with AP* profile option to *Yes*. When this profile option is set, Oracle Projects calls the Descriptive Flexfield Mapping extension during the processes that interface transactions between the two applications.

You can modify the extension to customize how descriptive flexfields are mapped when they are transferred.

> **Note:** Oracle Projects holds 10 descriptive flexfield segments. If you are using more than 10 segments in Payables, only the first 10 are imported to Oracle Projects.

Description

The extension is identified by the following items:

Item	Name
Specification template	PAPDFFCS.pls
Body template	PAPDFFCB.pls
Package	pa_client_extn_dfftrans

Item	Name
Function	dff_map_segments_f
Procedure	dff_map_segments_PA_and_AP

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Arguments Passed by the Calling Modules

The calling modules are:

- PRC: Interface Expense Reports from Payables (PAAPIMP)
- PRC: Interface Supplier Invoices from Payables (PAAPIMP)
- PRC: Interface Expense Reports to Payables (PATTER)
- PRC: Interface Supplier Invoice Adjustment Costs to Payables (PAVTVC)

PRC: Interface Expense Reports from Payables (PAAPIMP)

The following table shows the arguments that the Interface Expense Reports from Payables process passes to the client extension:

Parameter	Argument
P_TRX_REF_1	AP_INVOICE_DISTRIBUTIONS.INVOICE_ID
P_TRX_REF_2	AP_INVOICE_DISTRIBUTIONS.DISTRIBUTION_LINE_NUMBER
P_TRX_TYPE	AP_INVOICES.INVOICE_TYPE_LOOKUP_CODE
P_SYSTEM_LINKAGE_FUNCTION	"VI"
P_SUBMODULE	AP_INVOICES.SOURCE

PRC: Interface Supplier Invoices from Payables (PAAPIMP)

The following table shows the arguments that the Interface Supplier Invoices from Payables process passes to the client extension:

Parameter	Argument
P_TRX_REF_1	AP_INVOICE_DISTRIBUTIONS.INVOICE_ID
P_TRX_REF_2	AP_INVOICE_DISTRIBUTIONS.DISTRIBUTION_LINE_NUMBER
P_TRX_TYPE	"EXPENSE REPORT"
P_SYSTEM_LINKAGE_FUNCTION	"ER"
P_SUBMODULE	AP_INVOICES.SOURCE

PRC: Interface Expense Reports to Payables (PATTER)

The following table shows the arguments that the Interface Expense Reports to Payables process passes to the client extension:

Parameter	Argument
P_TRX_REF_1	PA_EXPENDITURE_ITEMS.EXPENDITURE_ITEM_ID
P_TRX_REF_2	PA_COST_DISTRIBUTION_LINES.LINE_NUM
P_TRX_TYPE	"EXPENSE REPORT"
P_SYSTEM_LINKAGE_FUNCTION	"ER"
P_SUBMODULE	null

PRC: Interface Supplier Invoice Adjustment Costs to Payables (PAVTVC)

The following table shows the arguments that the Interface Supplier Invoice Adjustment Costs to Payables process passes to the client extension:

Parameter	Argument
P_TRX_REF_1	PA_EXPENDITURE_ITEMS.EXPENDITURE_ITEM_ID
P_TRX_REF_2	PA_COST_DISTRIBUTION_LINES.LINE_NUM
P_TRX_TYPE	AP_INVOICES.INVOICE_TYPE_LOOKUP_CODE
P_SYSTEM_LINKAGE_FUNCTION	"VI"
P_SUBMODULE	null

Sample Descriptive Flexfield Mapping Extension

The client extension body file, PAPDFFCB.pls, provides a sample descriptive flexfield mapping client extension. In the example, segments are mapped based on the system linkage function of the expenditure item.

DFF_Map_Segments_F Function

The dff_map_segments_f function provides the mapping logic for descriptive flexfields segments.

The default logic maps segment *n* in the originating application to segment *n* in the receiving application. You can change this function to map the segments according to your business rules.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

DFF_Map_Segments_PA_and_AP Procedure

The dff_map_segments_PA_to_AP procedure calls the function dff_map_segments_f, and stores the mapped segments in the parameters p_attribute_1 through p_attribute_10.

You can modify this procedure to customize the attribute category mapping. An example of code for mapping the attribute category is provided in the extension.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Profile Options in Oracle Projects, *Oracle Projects Implementation Guide*

Archive Project Validation Extension

Use this extension to define additional business rules for validating projects. For a list of the basic business rules for validating projects see: Prerequisites for Purging Projects, *Oracle Projects Fundamentals*.

Description

This extension is identified by the following items:

Item	Name
Body template	PAXAPVXB.pls
Specification template	PAXAPVXS.pls
Package	PA_Purge_Extn_Validate
Procedure	Validate_Extn

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Validate Projects Procedure

The name for this procedure is *Validate_Extn*. By default, the procedure returns NULL to the calling program.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Archive Custom Tables Extension

Use this extension if you want to archive and purge your custom tables. For example, if

you maintain custom tables for project transaction data, you can use the Archive Custom Tables Extension to archive and purge these tables as part of the standard purge process.

The extension is identified by the following items:

Item	Name
Body template	PAXAPPXB.pls
Specification template	PAXAPPXS.pls
Package	PA_Purge_Extn
Procedure	PA_Purge_Client_Extn

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Archive Custom Tables Procedure

The Archive Custom Tables procedure name is *PA_Purge_Client_Extn*. By default, the procedure returns NULL to the calling program.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

9

Oracle Project Costing Client Extensions

This chapter describes the client extensions in the Oracle Project Costing application.

This chapter covers the following topics:

- Transaction Control Extensions
- AutoApproval Extensions
- Labor Costing Extensions
- Labor Transaction Extensions
- Overtime Calculation Extension
- Burden Costing Extension
- Burden Resource Extension
- Allocation Extensions
- Asset Allocation Basis Extension
- Asset Assignment Extension
- Asset Lines Processing Extension
- Capital Event Processing Extension
- Capitalized Interest Extension
- CIP Grouping Extension
- CIP Account Override Extension
- Depreciation Account Override Extension
- Cross-Charge Client Extensions

Transaction Control Extensions

Transaction control extensions enable you to define your own rules to implement company-specific expenditure entry policies. Some examples of rules that you may

define are:

- You cannot charge labor hours for a future date
- You cannot charge new transactions to projects for which the work is complete; you can only transfer items to these projects
- You can only charge to tasks that are managed by the organization you are assigned to
- All entertainmentexpenses are non-billable

Validation

You can use transaction control extensions to provide additional validation based on any type of data you enter in Oracle Projects. For example, you can check the project status for a particular project during expenditure entry.

You can validate any transaction entered into Oracle Projects, including transactions from other Oracle Applications and from external systems. For example, you can validate project-related supplier invoices entered into Oracle Payables. You can also validate items that you transfer from one project to another.

Transaction control extensions validate expenditures items one at a time; all validation is done for each expenditure item. Oracle Projects checks each expenditure item during data entry; the transaction is validated before you commit it to the database.

Processing

Oracle Projects processes transaction control extensions after the standard validation performed for expenditure entry, and after validating any transaction controls entered at the project or task level.

1. Standard validation
   - Transaction is within start and completion dates of project/task
   - Project status is not *Closed*
   - Task is chargeable
   - Transaction controls at project/task level
2. Transaction control extension validation

Designing Transaction Control Extensions

You should determine the logic and the additional data elements your client extensions

require before you write them. We recommend that you consider some additional design issues for transaction control extensions:

- What are the business rules?
- What validation is required? Under what conditions does it apply?
- Are there any exceptions to the validation? How are exceptions handled?
- In what order should the transaction controls be executed if you have multiple rules?
- What error message should users see when entering a transaction not allowed by transaction control extensions?
- Are there any rules to set the default billable or capitalizable status of transactions?

Writing Transaction Control Extensions

The extension is identified by the following items:

Item	Name
Body template	PAXTTCXB.pls
Specification template	PAXTTCXS.pls
Package	Patcx
Procedure	tc_extension

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Writing Error Messages

You write error messages that will be displayed in forms when a transaction control violation is encountered. Use these messages to tell users why a particular transaction cannot be entered, based on validation in the procedure. These messages also appear on the Transaction Import exception report and indicate the reasons why transactions may be rejected by Transaction Import.

Be sure to define your messages under the Oracle Projects application.

> **Warning:** During a software upgrade, messages are not preserved. Before you upgrade Oracle Projects to a new release, be sure that you move the messages to a custom application and set the parameter *Delete customer added rows* to NO. After the upgrade, move the messages from the custom application to Oracle Projects.

The messages are stored in the table FND_NEW_MESSAGES.

See: Defining Messages *Oracle Application Object Library Reference Manual*.

Procedure

The name of the transaction control extension procedure is tc_extension.

Parameter values for this procedure are passed from the expenditure item that is being validated. You can view descriptions of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Additional Information About Parameters

Following is additional information about the parameters for this procedure.

Attributes

For the X_attribute parameters, you can use any attribute from the expenditure item descriptive flexfield. These parameters are not available for modules outside Oracle Projects.

Quantity

You can use the quantity parameter for validation using Oracle Projects and Oracle Payables features. However, keep in mind that Oracle Purchasing does not pass a value for this parameter.

Incurred by Person

Oracle Projects passes the person who is incurring the transaction. This value is always specified for labor and expense report items. It is optional for usage items, because you can enter usage logs which are incurred by an organization, and not an employee.

Oracle Payables passes a parameter value for supplier invoice transactions if the supplier of the invoice is an employee; otherwise this value is blank for supplier invoice transactions.

Oracle Purchasing does not pass a value for this parameter for requisitions and purchase orders transactions.

Billable/Capitalizable Flag

Oracle Projects passes in the billable value (contract projects) or capitalizable value (capital projects) that it has determined from the project and task transaction controls and the task billable status for this parameter. You can override this value based on logic that you write in your procedure. You can pass back a value of Y or N to specify the default billable or capitalizable status of a transaction. If you do not pass back a value, or if you pass back an invalid value, Oracle Projects uses the original value that it determined before calling the transaction control extension procedure.

Outcome Parameter

Use the X_outcome parameter to pass back the outcome of the procedure. If the transaction successfully passes all applicable transaction control extension rules that you defined, leave the X_outcome parameter value as a null value. Oracle Projects then knows that this transaction passed all transaction control validation.

If the transaction does not pass a rule that you define, set the X_outcome value to the appropriate error message name that will be displayed to the user.

Calling Modules

The calling module parameter indicates which program called the transaction control extension. You can vary the logic of the extension based on the calling module. For example, if Transaction Import is the calling module (PAXTRTRX), then allow only certain types of transactions to be charged to specific projects.

Below is a list of the possible values for the X_CALLING_MODULE parameter. Note that these values are case-sensitive and are passed exactly as they appear.

When transaction controls are called by Oracle Purchasing and Oracle Payables, the validation is performed when you enter project-related information for requisitions, purchase orders, and supplier invoices. The validation is also performed when you enter or update the project-related information for distribution lines.

The following list shows possible values for X_CALLING_MODULE, and the corresponding meaning for each value:

apiindib.pls

Payables invoice distributions

apiimptb.pls

Payables invoice import

APXINENT

Invoices Workbench in Oracle Payables. This value is passed when Transaction Controls is called to validate project-related information entered on a supplier invoice.

CreateRelated Item	CreateRelatedItem procedure called in the labor transactions extension procedure. This value is passed when CreateRelatedItem calls Transaction Controls to validate related transactions in the labor transactions extension procedure.
PAVVIT	Interface Supplier Invoices from Payables. This value is passed when Transaction Controls is called to validate expenditure items being created from project-related supplier invoice distribution lines interfaced from Oracle Payables into Oracle Projects.
PAXTREPE	Pre-Approved Expenditures. This value is passed when Transaction Controls is called to validate unapproved expenditure items being entered or updated in the Enter Pre-Approved Expense Reports form.
PAXTRTRX	Transaction Import. This value is passed when Transaction Controls is called by the Transaction Import program to validate transactions before they are loaded into Oracle Projects.
PAXEXCOP/ PAXTEXCB	Copy Pre-Approved Timecards/Copy Expenditures. This value is passed when Transaction Controls is called to validate new expenditure items being created using the Copy Pre-Approved Timecards feature.
PAXPRRPE	Adjust Project Expenditures. This value is passed when Transaction Controls is called to validate a new expenditure item that is being created as a result of an expenditure item transfer performed in the Adjust Project Expenditures form.
PAXVOTCB	Oracle Time and Labor
PAXVSSTS	Oracle Internet Time
POWEBREQ	iProcurement
POXPOEPO	Purchase Orders in Oracle Purchasing. This value is passed when Transaction Controls is called to validate project-related information entered on a purchase order.
POXRQERQ	Requisitions in Oracle Purchasing. This value is passed when Transaction Controls is called to validate project-related information entered on a requisition.

POXPOERL	Releases in Oracle Purchasing. This value is passed when Transaction Controls is called to validate project-related information when you enter releases against purchase orders.
POXPOPRE	Preferences in Oracle Purchasing.
Project Deliverables	This value is passed when Transaction Controls is called to validate expenditure information for a deliverable procurement action.
REQIMPORT	Requisition import
SelfService	Expense reports

Frequently Asked Questions

Following are frequently asked questions regarding the transaction control extension.

Can I call other procedures within the extension?	You can call other procedures. As long as you can determine the inputs and perform the validation for a particular rule, your extensions can be as flexible as you want them to be.
Can I allow exceptions to a rule?	Yes; for example, you can allow exceptions to a rule that applies to a project type by limiting the rule to particular projects for the project type in the procedure logic.
Can the extension validate groups of expenditure items?	Currently, you cannot perform validation on groups of expenditure items.
How many error messages can the procedure return?	Your procedure can return one error message, which is the first error message that Oracle Projects encounters in your procedure.

Related Topics

Designing Client Extensions, page 7-2

Case Study: New Charges Not Allowed

This case study demonstrates how to use a client extension to disallow new charges to completed projects.

Business Rule

You have decided that you do not want anyone to charge new transactions to projects

for which the work is complete. However, to properly account for project work performed, these projects will allow new transactions resulting from transfers between projects.

Requirements

The business rule will be carried out as follows:

- Do not allow new expenditure items to be charged to projects having a project status of *Processing Only*
- Allow expenditure items to be transferred to projects having a project status of *Processing Only*
- Display an error message when a user tries to enter new expenditure items charged to projects having a project status of *Processing Only*
- Do not allow any exceptions to this business rule

You could easily implement an exception to this rule regarding new charges from transfers only. An exception to this rule is to also allow supplier invoice transactions, which are typically received after the project work is complete.

Required Extension

To implement the business rule of controlling new charges to projects for which the work is complete, use the transaction control extension.

> **Tip:** Review the sample PL/SQL code that corresponds to the implementation of this case study in the file PAXTTCXB.pls.

Additional Implementation Data

You need to define a new project status of *Processing Only*.

Design Considerations for New Charges Not Allowed

The design considerations are described below:

Identifying Transferred Items — You know if the item you are validating is a transfer from another project or task by looking at the value of the x_transferred_from_id parameter passed into your extension.

Determining Project Status — The project status is not passed as a parameter to the transaction control extension. Therefore, you need to derive this value from the project ID.

Defining an Error Message

If an item is a new item being charged to a project with a project type having the status of *Processing Only*, you want to display an error message to the user. The user can then change the project assignment of the new expenditure item to a different project.

You define an error message with the text, "You cannot create new items for *Processing Only* projects".

Case Study: Organization-Based Transaction Controls

This case study demonstrates how to use a client extension to set up transaction controls by organization.

Business Rule

You want all administrative work to be charged to tasks that are managed by the employee's organization. When the employee is not specified, charge the administrative work to the expenditure organization.

Requirements

The business rule will be carried out like this:

- Tasks with a service type of *Administration* allow charges only for employees assigned to the same organization as the task-owning organization
- For usages not associated with a specific employee, the expenditure item must have been charged by the same expenditure organization as the task organization
- Display an error message when a user tries to enter an expenditure item that violates this rule
- Do not allow any exceptions to this business rule

You can easily implement an exception to this rule, in which this rule does not apply to any projects that are managed by the *Executive* office. This exception exists because the Executive office uses resources throughout the company to perform important administrative work. The Executive office does not want to set up projects with a task for every organization that may help with the project work.

Required Extension

To implement the business rule of organization-based transaction controls, use the **Transaction Control Extension**.

Tip: Review the sample PL/SQL code that corresponds to the

implementation of this case study in the file PAXTTCXB.pls.

Additional Implementation Data

You need to define a new task service type of *Administration*.

Design Considerations for Organization-Based Transaction Controls

The design considerations are described below:

Determining Incurred by Organization

Because the incurred by organization of each transaction being evaluated is passed to the transaction control extension procedure, you do not need to derive the organization.

Determining Task Organization

Task organization is not passed as a parameter to the transaction control extension. Therefore, you need to derive this value.

Determining Task Service Type

The task service type is not passed as a parameter to the transaction control extension. Therefore, you need to derive this value.

Defining an Error Message

If an item being charged to a task violates this rule, you want to display an error message to the user. The user can then change the task assignment to a different value.

You define an error message with the text, "Only the task-owning organization can charge to this task".

Case Study: Default Billable Status by Expenditure Type

This case study demonstrates how to use a client extension to specify a default billable status based on the expenditure type.

Business Rule

You have decided that you want to implement the business rule that no one can bill entertainment charge to projects.

Requirements

The business rule will be carried out like this:

- Transactions with an expenditure type of *Entertainment* are non-billable for all projects, regardless of the task's billable status

- There are no exceptions to this rule within the client extension; exceptions for negotiated billing of *Entertainment* expenses are marked as billable using the Adjust Project Expenditures form.

- Do not return an error message to the user for any expenditure types of *Entertainment*; simply set the billable status to non-billable for affected transactions.

Required Extension

To implement the business rule of determining the default billable status by expenditure type, use the Transaction Control Extension**.**

> **Tip:** Review the sample PL/SQL code that corresponds to the implementation of this case study, view the file PAXTTCXB.pls.

Additional Implementation Data

You need to define a new expenditure type of *Entertainment*.

Design Considerations for Default Billable Status by Expenditure Type

The design considerations are described below:

Deriving Additional Information

Because the expenditure type of each transaction being evaluated is passed to the transaction control extension procedure, you do not need to derive any additional data to implement this business rule.

Determining Billable Status

You can simply code your procedure to look at the expenditure_type parameter; if the expenditure type is Entertainment, set the x_billable_flag parameter to N to implement this business rule.

AutoApproval Extensions

The AutoApproval Extensions contain procedures to define conditions under which expense reports and timecards are approved automatically. Each procedure includes examples that you can copy and modify.

You can view descriptions of all of the parameters for these procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter

order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

The AutoApproval extensions include the following extensions:

AutoApproval Profile Options Extension

This procedure performs custom validation for all the expenditure items in an expenditure. The extension is identified by the following items:

Item	Name
Body Template	PAXPTEEB.pls
Specification Template	PAXPTEES.pls
Package	pa_client_extn_pte
Procedure	get_exp_autoapproval

Expenditure Summary AutoApproval Extension

This extension contains default logic to read the values of the AutoApproval profile options. The extension is identified by the following items:

Item	Name
Body Template	PAXTGTCB.pls
Specification Template	PAXTGTCS.pls
Package	pagtcx
Procedure	summary_validation_extension

Timecard AutoApproval Extension

Use this procedure to incorporate additional approval logic for timecards. The extension is identified by the following items:

Item	Name
Body Template	PAXTRT1B.pls
Specification Template	PAXTRT1S.pls
Package	pa_client_extn_rte
Procedure	check_approval

AutoApproval Routing Extension

Use this procedure to define rules for routing timecards and expense reports for approval. The extension is identified by the following items:

Item	Name
Body Template	PAXTRTEB.pls
Specification Template	PAXTRTES.pls
Package	paroutingx
Procedure	route_to_extension

Timecard Entry AutoApproval Extension

Use this procedure to define validations during entry and approval of timecards in Oracle Time and Labor. For more information about this client extension, see the *Oracle Time and Labor Implementation and User Guide*.

The extension is identified by the following items:

Item	Name
Body Template	PAPSSTCB.pls
Specification Template	PAPSSTCS.pls

Item	Name
Package	pa_time_client_extn
Procedure	display_business_message

Labor Costing Extensions

Labor costing extensions allow you to derive raw cost amounts for individual labor transactions. Some examples of labor costing extensions you may define are:

- Standard cost rate by job
- Capped labor cost rates
- Multiple cost rates per employee

You can use labor costing extensions to implement unique costing methods other than the standard method, which calculates raw cost using the number of hours multiplied by the employee's hourly cost rate. For example, you may want to calculate the raw cost using a capped labor rate for specific employees.

Processing

Oracle Projects processes labor costing extensions during labor cost distribution before calculating standard raw cost amounts. If Oracle Projects encounters a labor costing extension that derives the raw cost amount of a labor transaction, it skips the standard raw cost calculation section for that transaction.

Designing Labor Costing Extensions

Consider the following design issues for labor costing extensions:

- What are the conditions and circumstances in which you cannot use the standard raw cost calculation method supported by Oracle Projects?
- How is the raw cost amount calculated in these cases?
- How do you identify labor transactions that meet these conditions?
- How do you store rates and other additional information that your calculations may require? How are the rates and other information maintained?
- What are the exception conditions for your labor costing extension? What is the

exception handling if you cannot find a rate that should exist?

Writing Labor Costing Extensions

The extension is identified by the following items:

Item	Name
Body template	PAXCCECB.pls
Specification template	PAXCCECS.pls
Package	PA_Client_Extn_Costing
Procedure	Calc_Raw_Cost

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Calculate Raw Cost

The name of this procedure is PA_Client_Extn_Costing.Calc_Raw_Cost.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Using x_raw_cost

The raw cost amount that your procedure calculates is assigned to the x_raw_cost parameter. Leave this value blank if you want to use the standard costing method which uses the employee's hourly cost rate.

If you pass a value to this parameter, Oracle Projects calculates the raw cost rate of the transaction using the x_raw_cost parameter value divided by the number of hours.

Using x_status

Use the x_status parameter to handle error conditions for your procedure. This parameter indicates the processing status of your extension as follows:

x_status = 0 The extension executed successfully.

x_status < 0	An Oracle error occurred and the process did not complete. Oracle Projects writes an error message to the process log file.
x_status > 0	An application error occurred. Oracle Projects writes a rejection reason to PA_EXPENDITURE_ITEMS.COST_DIST_REJECTION_CODE and does not cost the transaction. You can review the rejection reason in the labor cost distribution exception report.

Labor Transaction Extensions

Labor transaction extensions allow you to create additional transactions for individual labor items charged to projects. For example, you may wish to create additional transactions for hazardous work performed for every labor transaction charged to certain projects. Here are some other examples of labor transactions extensions you can implement:

- Create overtime premium transactions for overtime hours based on company overtime policies
- Create fringe benefit transactions which are charged to the same project the source labor was charged to

You can create additional transactions for straight time labor transactions and overtime labor transactions. You create additional labor transactions based on the source labor transactions that you enter on timecards.

Related Transactions

Additional transactions that are created for labor transactions are referred to as *related transactions*. All related transactions are associated with a *source transaction* and are attached to the expenditure item ID of the source transaction. You can identify and process the related transactions by referring to the expenditure item ID of the source transaction.

You create related transactions to process a raw cost amount separately than the source transaction raw cost amount. Related transactions can be burdened, billed, and accounted for independently of the source transaction.

Processing

Oracle Projects processes labor transaction extensions during labor cost distribution. When you distribute labor costs, the labor transaction extension is processed after the raw cost calculation of the source transactions. This allows you to derive the cost of the related transaction from the cost of the source transaction.

You also use the labor transaction extension to calculate new cost amounts for related transactions if the source transaction is recosted.

If you are using the Labor Transaction Extension to create overtime premium transactions, you may not need to use the Overtime Calculation program that Oracle Projects provides. If you determine that you need to use both the Labor Transaction Extension and the Overtime Calculation program, you need to ensure that you have defined conditions so that each transaction is processed by only one of these processes, based on your company policies.

Designing Labor Transaction Extensions

Consider the following design issues for labor transaction extensions:

- What are the conditions in which your company needs to create related items? Why are you creating related items instead of using another method like burdening to account for additional costs?
- How do you identify labor transactions that meet these conditions?
- What related transactions should be created in these cases?
- What project and task are the related transactions charged to?
- What expenditure types are used for the related transactions?
- How is the raw cost of the related transaction calculated? Is it based on the raw cost of the source transaction or based on some other calculation?
- Is the related transaction burdened? If so, you need to set up your cost plus implementation so that the transaction is burdened.
- How is the related transaction's cost accounted for? Is the raw cost accounting for related transactions different from the accounting for source transactions? Is the total burdened cost accounting different (if you use total burdened cost accounting)? You need to define your AutoAccounting rules for labor costs appropriately.
- How is the billable status of each related transaction determined? Do you need to create a transaction control extension rule to properly specify the related transaction's billable status?
- Are the related transactions billed? If so, under what conditions? How is the bill amount calculated under the different billing methods? Do you need to use a labor billing extension to bill these transactions?
- Is the related transaction's revenue accounted for differently than the source transactions? If so, how? You need to define your AutoAccounting rules for labor

revenue appropriately.

- What are the exception conditions for your labor transaction extension? For example, what is the exception handling if you cannot find a rate for the related transaction if the related transaction's raw cost is not directly based on the source transaction's raw cost?

Writing Labor Transaction Extensions

The extension is identified by the following items:

Item	Name
Body template	PAXCCETB.pls
Specification template	PAXCCETS.pls
Package	PA_Client_Extn_Txn
Procedure	Add_Transactions

Oracle Projects also provides two public procedures that you use within the Add_Transactions procedure for the following purposes:

- Creating Related Transactions
- Updating Related Transactions

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Add Related Transactions

Use the add_transactions procedure to add related transactions for source transactions. Within this procedure, you write logic to create related new transactions and update the raw cost of related transactions when they are marked for cost recalculation. You calculate the raw cost of related transactions in this procedure only; Oracle Projects does not calculate the raw cost of related transactions in any other way. Use the two procedures discussed later in this section for processing related transactions within this procedure.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Create Related Transactions

Use the pa_transactions.CreateRelatedItem procedure to create related transactions within the logic of the Add Transactions procedure. This procedure exists in the *pa_transactions* package. You cannot change this procedure.

The related transaction is linked to the same employee's timecard as the source transaction. The transaction is created with a quantity of 0, in order to maintain the proper number of hours for the employee's timecard, even when related transactions exist.

The CreateRelatedItem procedure does the following:

- Ensures all input parameter values are valid values
- Ensures that the expenditure type is classified with an expenditure type class of *Straight Time* or *Overtime*
- Validates that the transaction passes all transaction controls validation rules, including logic in transaction control extensions
- Determines the billable status of the related transaction using the same method used for all Oracle Projects transactions
- If the transaction is valid, creates related labor expenditure item that:
    - Is attached to the source transaction's expenditure
    - Has quantity of 0 (to maintain the number of hours for the employee's timecard, even when related items exist for that timecard)
    - Uses the source transaction's project and task unless you specify project and task input values
    - Uses the source transaction's expenditure item date and bill hold value
    - Uses the source transaction's organization unless you specify an override organization
    - Rounds the raw cost to 2 decimal places and uses the raw cost rate that you passed into it

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Updating Related Transactions

Use the pa_transactions.UpdateRelatedItem procedure to update the raw cost amount of existing related transactions within the logic of your labor transaction extension when related transactions are marked for cost recalculation. This procedure is located in the *pa_transactions* package. You cannot change this procedure.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Information About Parameters

Details about some of the parameters are shown below.

Using Project and Task in the CreateRelatedItem Procedure

You can optionally pass the project and task parameter values to the CreateRelatedItem procedure.

If you do not pass project and task information, Oracle Projects charges the related transaction to the same project and task that the source transaction is charged to.

If you do pass project and task information, Oracle Projects uses these values to ensure that the transaction can be charged based on the transaction control validation for that project and task. If the related transaction passes all transaction control rules, then the related transaction is created with that project and task. You must pass both a project and task value to override the source transaction's project and task.

Using Userid in the CreateRelatedItem procedure

You must provide an input value for the X_userid parameter for the CreateRelatedItem procedure. Oracle Projects passes this value to the transaction control procedure, which is called before the related transaction is created. You may have defined logic in your transaction control extensions that uses the userid value. You typically pass the user of the person who created the source transaction, but you can pass any userid that you want to the CreateRelatedItem procedure.

Using an Override Organization in CreateRelatedItem Procedure

Use the x_override_to_org_id to override the source transaction's expenditure organization to another organization, such as the project organization for the related transaction.

If a value is provided for this parameter when calling the create related transactions procedure, and it is a valid

organization, then that value is stored as the expenditure item's override organization *regardless* of the existence of any other cost distribution overrides defined for the project.

This organization is then used when calculating burdened amounts for the related transaction. It is also used as the input value for any AutoAccounting rules that use the expenditure organization parameter.

However, the source transaction expenditure organization is what the create related transaction procedure passes to the transaction controls procedure for validation. This is done to retain consistency with expenditure entry forms which always send the incurred by (or expenditure organization) organization value. The expenditure organization parameter is used in Transaction Control Extensions by clients who want to control expenditure entry by what organization is *charging to* the project.

Therefore, the override organization value is used only for burdening and AutoAccounting.

Using Outcome in the CreateRelatedItem Procedure

Oracle Projects uses the X_outcome parameter to pass back the rejection reason encountered in the application logic of the CreateRelatedItem procedure. For example, if the related transaction is rejected by the transaction controls validation called in the CreateRelatedItem procedure, then the reason is assigned to the X_outcome parameter.

Using Status in both Procedures

Use the x_status parameter to handle error conditions for your procedure. This parameter indicates the processing status of your extension as follows:

x_status = 0	The extension executed successfully.
x_status < 0	An Oracle error occurred and the process did not complete. Oracle Projects writes an error message to the process log file.
x_status > 0	An application error occurred. Oracle Projects writes a rejection reason to PA_EXPENDITURE_ITEMS.COST_ DIST_REJECTION_CODE and

does not cost the source and related transactions. You can review the rejection reason in the labor cost distribution exception report.

The two related transaction procedures pass your labor transaction procedure the outcome of their processing in this same way as you pass the outcome of your labor transaction extension procedure to the labor distribution process.

Adjusting Related Transactions

Whenever an adjustment is performed on a source transaction that requires the item to be backed out (transfer, split, manual reversal through the Pre-Approved Expenditure form), Oracle Projects creates reversals for the related transactions of the source transaction.

You cannot independently process related transactions from the source transactions. However, there are adjustment actions for which related transactions are processed with the source transaction.

Frequently Asked Questions

Following are some frequently asked questions about the labor transaction extension.

What happens if the source transaction is not costed?

If the source transaction is not costed because it is rejected during cost distribution, the labor transaction extension is not called for that transaction. Therefore, related transactions for rejected source transactions will not be created or costed.

Can I create multiple related transactions for a single item?

Yes, you can create multiple related transactions for a given source transaction based on the logic in your labor transaction extension.

How do I identify related transactions?

You identify related transactions by referring to the expenditure item id of the source transaction.

In the expenditure inquiry forms and reports within Oracle Projects, you can identify related transactions based on your implementation data used for related transactions, particularly the expenditure type. Oracle Projects displays all related transactions immediately after the source transaction.

What if some parameters are

What if some parameters are not passed to CreateRelatedItem?

All parameters that are not passed to the related transactions procedure are read from the source transaction; except for quantity, billable status, and expenditure type. The quantity is set to 0 for the related transactions. The billable status is derived based on the transaction controls and transaction control extensions that you define. Expenditure type is a required parameter that you provide.

What if a related transactions does not pass validation?

If a related transaction does not pass validation in the CreateRelatedItem procedure, Oracle Projects does not create the related item, and marks the source transaction with a cost distribution rejection reason specifying that an error was encountered in the labor transaction extension procedure. The source item is not marked as cost distributed and is displayed in the exception output report in the Distribute Labor Costs process.

Where can I establish the billable or capitalizable status of related transactions?

The related transaction's billable or capitalizable status is derived using transaction controls and task billable or capitalizable status like all other transactions. You can further derive the billable or capitalizable status of related transactions by including logic in the transaction control extension procedure to look at related transactions based on certain criteria, and then setting the billable or capitalizable flag. The transaction control package, which establishes the billable or capitalizable status, is called within the CreateRelatedItem procedure.

How does the transaction controls procedure identify related transactions?

The transaction control procedure, which establishes the billable or capitalizable status and validates transactions, is called within the CreateRelatedItem procedure.

The transaction control extension identifies related transactions by the x_module of the CreateRelatedItem procedure. When the calling procedure (CreateRelatedItems) calls transaction controls, the x_module is set to *CreateRelatedItem*.

Can I calculate raw cost amounts of related transactions using burden costing?

You can use the Cost Plus API to determine raw cost amounts of related transactions based on your burden costing setup.

Related Topics

Distributing Labor Costs, *Oracle Project Costing User Guide*

Creating Overtime, *Oracle Project Costing User Guide*

Adjustments to Related Transactions, *Oracle Project Costing User Guide*

Designing Client Extensions, page 7-2

Cost Plus Application Programming Interface (API), page 4-7

Adjustments to Related Transactions, *Oracle Project Billing User Guide*

Overtime Calculation Extension

The overtime calculation extension enables you to define your own rules to implement company-specific overtime calculation policies. The extension calculates overtime costs and charges them to an indirect project other than the project where the labor was charged.

> **Note:** If you want to charge overtime to the project where the labor was charged, consider creating items via the labor transaction extension.
> See: Labor Transaction Extensions, page 9-16.

For more information on the context and setup of overtime calculations, see: Implementing Overtime Charged to an Indirect Project, *Oracle Projects Implementation Guide*.

Processing

Oracle Projects calls the Overtime Calculation Extension during the Distribute Labor Costs process.

Designing Overtime Calculation Extensions

Oracle Projects provides a template Overtime Calculation extension. You can use the template to understand the extension, and then make appropriate changes to meet your business needs. Before modifying the extension, read the following essay and related case studies on implementing overtime: Overview of Tracking Overtime, *Oracle Project Costing User Guide*.

Implementing Your Company's Overtime Calculation Extension

If you decide to use automatic overtime calculation, you can implement your company's overtime policies using the template Overtime Calculation extension as a starting point.

Your technical staff can customize the Overtime Calculation extension to accommodate the overtime rules that your business uses.

We recommend that you complete the following steps to implement your company's Overtime Calculation extension:

- Define and document your overtime policy
- Use your documented overtime policy to determine the kind of implementation data you need to drive automatic overtime calculation. This implementation data may include labor costing rules, expenditure types, labor cost multipliers, and an overtime project and tasks
- Define the implementation data necessary to drive automatic overtime calculation
- Have your technical staff code your overtime policy in the Overtime Calculation extension
- Test your implementation data and Overtime Calculation extension to ensure that it correctly implements your company's overtime policies

A few additional notes about implementing the Overtime Calculation extension are:

- Define all overtime expenditure types with an end date so that timecard clerks cannot enter overtime through the Pre-Approved Expenditures window
- Base automatic overtime calculation on weekly overtime rules. Oracle Projects is designed to process weekly timecards; all expenditure item dates of a timecard must be within the expenditure week ending date of the timecard. Therefore, automatic overtime calculation is most easily performed based on weekly overtime rules

How the Overtime Calculation Extension Processes Overtime

The Overtime Calculation extension template follows these steps to process overtime:

- Determines all employees and corresponding weeks which may include new overtime to process. The Overtime Calculation extension calculates and creates overtime only for employees with timecards processed in the run of Distribute Labor Costs that calls the Overtime Calculation extension. These employees and weeks are identified by the request_id of the straight time expenditure items that are costed before the Overtime Calculation extension is called.
- Sums the hours required to calculate overtime for identified employees and weeks. The standard Overtime Calculation extension sums the total hours for the week and the total hours for each day of the week, relying on the timecard entry validation rule that all labor expenditure item dates must be within the expenditure week ending date of the timecard.
- Calculates overtime hours based on the hours worked, the employee's labor costing rule, and other criteria you might specify. The standard Overtime Calculation extension calculates overtime for an employee and a week based on the employee's labor costing rule described in the case study. See: Implementing Overtime Charged to an Indirect Project, *Oracle Projects Implementation Guide*.

- Creates overtime expenditure items for each type of overtime for which the employee is eligible. The overtime item is charged to the overtime project and appropriate overtime task that is specified in the Overtime Calculation extension using the overtime expenditure type defined for the employee's labor costing rule. The expenditure item date is set to the week ending date. The expenditure item is assigned the labor cost multiplier that is associated with the overtime task to which it is charged.

  The extension creates a new expenditure for each person and week that has new overtime items. The new expenditures are assigned to an expenditure batch created in the Overtime Calculation extension. The expenditure batch name is based on the Request ID number, and uses the prefix "PREMIUM". For example, an expenditure batch run under Request ID 1205 would be named *PREMIUM - 1205.*

- Lists employees with new overtime items on the Overtime Calculation Report.

After the Overtime Calculation extension has completed, the Distribute Labor Costs process costs the new overtime items.

Location and Package Name

The extension is identified by the following items:

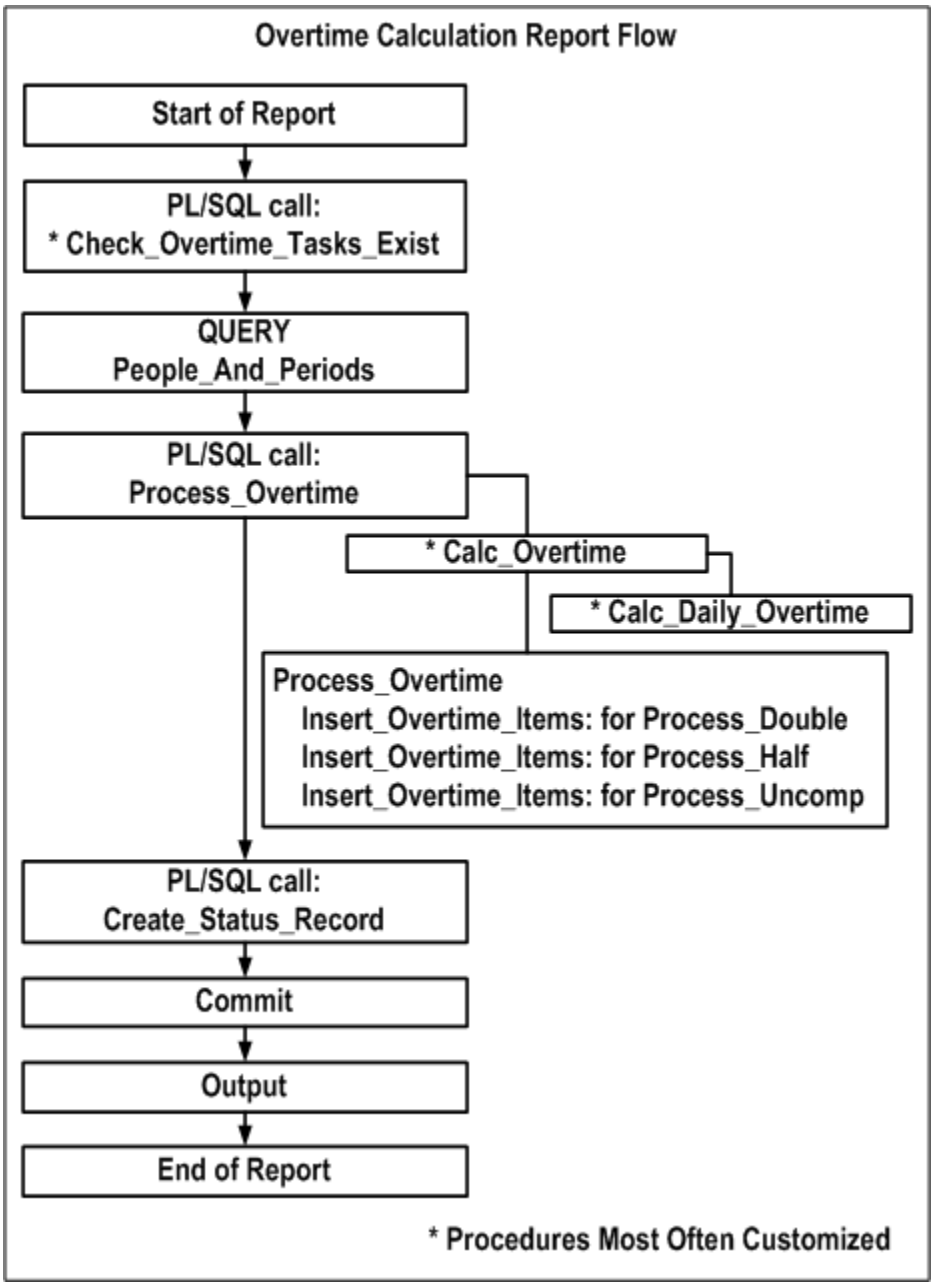
Item	Name
Body template	PAXDLCOB.pls
Specification template	PAXDLCOS.pls
Package	pa_calc_overtime

Structure of the Overtime Calculation Report

The Overtime Calculation Report is an output report generated by the Distribute Labor Costs process, using procedures in the Overtime Calculation extension. The report is only generated if you have implemented the Overtime Calculation extension.

The name of the template report is PAXDLIOT.rdf. It is located in the Oracle Projects reports directory. You do not need to modify this report. You should only need to modify the PL/SQL procedures in the overtime calculation extension template package. See: Location and Package Name, page 9-26.

The following illustration shows the structure of the Overtime Calculation Report. The procedures you are most likely to modify to implement your company's overtime rules are marked with an asterisk (*) in the diagram.



The report first calls the Check_Overtime_Tasks_Exist procedure. This procedure looks for overtime projects and tasks and returns all relevant task names, up to a maximum of five. These tasks determine the column titles in the report.

Next, the report queries the database for all records processed by the Distribute Labor Costs process. The report then calls the Process_Overtime procedure. This procedure determines the amount and type of overtime for each employee and period, creates new expenditure items for these values, and passes the values back to the report.

Calc_Overtime and Calc_Daily_Overtime are procedures used by the Process_Overtime procedure. You can decide whether to use these procedures in your customized extension.

Your extension must also adjust overtime that relates to any adjustments made to the original transactions. For best results, use the Process_Overtime procedure to create the new overtime records, as this procedure handles all the inserts and updates to the Oracle Projects tables.

Finally, the report calls the Create_Status_Record procedure. This procedure is called in the report PAXDLCOT.rdf to create a status record for the overtime calculation program. This record lets the costing program know whether the overtime calculation program is complete.

Related Topics

Overview of Tracking Overtime, *Oracle Project Costing User Guide*

Burden Costing Extension

Use the Burden Costing client extension to override the burden schedule ID.

Oracle Projects calls the Burden Costing extension during the cost distribution processes. You can modify the extension to satisfy your business rules for assigning burden schedules.

The extension is identified by the following items:

Item	Name
Specification template	PAXCCEBS.pls
Body template	PAXCCEBB.pls
Package	pa_client_extn_burden
Procedure	override_rate_rev_id

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Override Burden Schedule ID

The Override Burden Schedule ID procedure (override_rate_rev_id) assigns a burden cost schedule to a transaction.

You can view descriptions of all of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Entering Project and Task Options, *Oracle Projects Fundamentals*

Rate Schedules, *Oracle Projects Implementation Guide*

Burden Resource Extension

You can use the burden resource extension to control the reporting of burden transactions so that summary burden transactions and their source raw transactions are reported under the same planning resource in a resource breakdown structure.

This extension includes the following items:

Item	Name
Body template	PAXBRGCB.pls
Specification template	PAXBRGCS.pls
Package	PA_CLIENT_EXTN_BURDEN_RESOURCE
Function	CLIENT_GROUPING
Procedure	CLIENT_COLUMN_VALUES

Client Grouping

The CLIENT_GOUPING function returns a VARCHAR2 value which is a concatenated string of the parameter values. You can customize the function to create the return string usingthe attributes by which you want to group each transaction. This string can be used as an additional grouping criterion.

Client Column Values

The CLIENT_COLUMN_VALUES procedure works in conjunction with the CLIENT_GROUPING function. It returns NULL for the parameters that are not used for additional grouping in the CLIENT_GROUPING function.

You can view descriptions of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Allocation Extensions

You can use the allocation extensions to expand the capabilities of the allocations feature.

Each allocation extension includes examples that you can copy and modify.

The allocations extensions include:

- Allocation Source Extension, page 9-30
- Allocation Target Extension, page 9-32
- Allocation Offset Tasks Extension, page 9-34
- Allocation Offset Projects and Tasks Extension, page 9-35
- Allocation Basis Extension, page 9-36
- Allocation Descriptive Flexfields Extension, page 9-37
- Allocation Dependencies Extension, page 9-38

Allocation Source Extension

This extension defines source projects and tasks. Oracle Projects calls this procedure when Use Client Extension Sources is selected in the Source window.

Use the Allocation Source extension when you want to include or exclude projects or tasks temporarily when creating a source pool. You may also find that it is more convenient to maintain a large list of source projects in the extension file rather than in the Sources window.

Description

For each allocation rule_id, the client populates the global session variable x_source_proj_tasks_tbl of the data type table alloc_source_tabtype. The allocation run process reads this table and uses the projects and tasks as the sources for any allocation

run that uses the rule. The projects and tasks are added to those projects and tasks specified in the source lines.

The extension includes the following items:

Item	Name
Body template	PAPALCCB.pls
Specification template	PAPALCCS.pls
Package	pa_client_extn_alloc
Procedure	source_extn

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Business Rules

The following business rules apply to this extension.

- The source project and the allocation rule must be from the same operating unit.
- The source task must be a top or lowest task.

Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Datatypes

The datatype *alloc_source_tabtype* contains the following parameters:

Parameter	Type	Description
PROJECT_ID	NUMBER	(Required) Identifier of the source project.
TASK_ID	NUMBER	Identifier of the source task

Parameter	Type	Description
EXCLUDE_FLAG	VARCHAR2(1)	(Default is N) Exclusion flag. If the value is Y, the project and task are excluded from the source project and tasks.

Validation

The Generate Allocation Transactions process:

- Validates project_id against the single organization view pa_projects
- Verifies that the project is open (that is, pa_project_stus_utils.is_project_closed(project_id) ='N' and template_flag ='Y')
- Validates task_id against view pa_alloc_src_tasks_v
- Verifies that the task belongs to the source project

If the validation fails, the Generate Allocation Transactions process populates the message "The client extension returned an invalid project or task."

Allocation Target Extension

This extension defines target projects and tasks. Oracle Projects calls this extension when Use Client Extension Targets is selected in the Targets window.

Use the Allocation Targets extension when you want to include or exclude projects or tasks temporarily when allocating amounts to target projects and tasks. You may also find that it is more convenient to maintain a large list of target projects in the extension file rather than in the Targets window.

Description

For each allocation rule_id, the client populates the global session variable x_target_proj_task_tbl of the data type table alloc_target_tabtype. The allocation run process reads the table and uses the specified project and chargeable tasks as the target for the allocation run. The system can use both the projects and tasks specified in the extension as well as those specified on the Targets window.

The extension includes the following items:

Item	Name
Body template	PAPALCCB.pls

Item	Name
Specification template	PAPALCCS.pls
Package	pa_client_extn_alloc
Procedure	target_extn

Procedure Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Datatype Parameters

One of the parameters for the allocation target extension is the datatype *alloc_target_tabtype.* This datatype contains the following parameters:

Parameter	Type	Description
PROJECT_ID	NUMBER	(Required) Identifies the target project. If cross-charging is enabled, target projects and source projects can be in different operating units.
TASK_ID	NUMBER	Identifies the target task (task must be chargeable)
PERCENT	NUMBER	The percentage of the pool amount allocated to this target. Express the value in numbers between 0 and 100 (for example, 45% is 45, not .45). NVL (percent,0). See Note on the Percent Parameter, page 9-33 .
EXCLUDE_FLAG	VARCHAR2(1)	(Default is N) If Y, exclude the project and task from the target project and tasks

Percent Parameter

If you want to use target percentages in a rule, specify the percentages either in the Targets window or within the extension, but not both. The Generate Allocation Transactions process ignores any target percentages in the rule if all of the following are true:

- The basis method for the allocation rule is *Target % and Spread Evenly* or *Target % and Prorate*

- The Targets window for the rule includes target lines.
- The client extension returns target percentages.

Validation

The Generate Allocation Transactions process:

- Validates project_id against view pa_alloc_target_proj_v
- Validates task_id against view pa_alloc_tgt_tasks_v
- Verifies that the task belongs to the target project

If the validation fails, the Generate Allocation Transactions process populates the message "The client extension returned an invalid project or task."

Allocation Offset Tasks Extension

This extension defines offset tasks. Oracle Projects calls this extension when Use Client Extension for Task is selected in the Offsets window. Use the Allocation Offset Tasks extension when you want to offset some source tasks but not others.

Description

The extension includes the following items:

Item	Name
Body template	PAPALCCB.pls
Specification template	PAPALCCS.pls
Package	pa_client_extn_alloc
Procedure	offset_task_extn

Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Validation

The Generate Allocation Transactions process:

- Validates task_id against pa_alloc_tgt_tasks_v
- Verifies that the returned tasks belong to the offset project that was provided as the input parameter

If the validation fails, the Generate Allocation Transactions process returns the message "The client extension returned an invalid project or task."

Allocation Offset Projects and Tasks Extension

This extension defines offset projects and tasks. Oracle Projects calls this extension when Use Client Extension for Project and Task is selected in the Offsets window.

Use this extension to specify more or different projects and tasks than are defined in the Sources window.

Description

For each allocation rule_id, the client populates the global session variable x_offset_proj_task_tbl of data type table alloc_offset_tabtype. The allocation run process reads the table to get the offset project, task, and offset amount for the allocation run. The sum of offset amounts assigned to each offset project and task equals the total offset amount (p_offset_amount).

The extension includes the following items:

Item	Name
Body Template	PAPALCCB.pls
Specification Template	PAPALCCS.pls
Package	pa_client_extn_alloc
Procedure	offset_extn

Procedure Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Datatype Parameters

One of the parameters for the allocation target extension is the datatype *alloc_offset_tabtype*. This datatype contains the following parameters:

Parameter	Type	Description
PROJECT_ID	NUMBER	(Required) Identifies the offset project. The offset project and the allocation rule must be from the same operating unit. The offset project must allow new transactions.
TASK_ID	NUMBER	(Required) Identifies the offset task (must be chargeable)
OFFSET_AMOUNT	NUMBER	(Required) The amount allocated to this project and task (Nvl(offset_amount,0)

Validation

The Generate Allocation Transactions process:

- Validates the project_id against the single organization view pa_projects
- Verifies that the project allows new transactions (that is, pa_project_utils.check_prj_stus_action_allowed (project_status_code,'NEW_TXNS')='Y' and template_flag !='Y')
- Validates task_id against pa_alloc_tgt_tasks_v
- Verifies that the task belongs to the offset project
- Validates the sum of the offset amount from client extension against p_offset_amount

If the validation fails, the Generate Allocation Transactions process populates one of these messages:

- 'The client extension returned an invalid project or task."
- 'The sum of offset amounts returned from the offset client extension does not equal the total offset amount passed to the client extension."

Allocation Basis Extension

Oracle Projects calls this extension when Use Client Extension Basis is selected in the Allocation Rule window. During the allocation run, the system calls the procedure to get the basis amount for each target project and task.

Use the Basis extension when you want to use amounts other than target costs to calculate the basis rate for target projects and tasks. For example, you may want to base the calculation on the number of people in a department, or the amount of floor space.

Description

The extension includes the following items:

Item	Name
Body template	PAPALCCB.pls
Specification template	PAPALCCS.pls
Package	pa_client_extn_alloc
Procedure	basis_extn

Procedure Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Validation

The Generate Allocation Transactions process validates the sum of basis amount returned from the client extension.

If the validation fails, the Generate Allocation Transactions process populates the message "The total basis amount cannot be 0. No allocation can be performed."

Allocation Descriptive Flexfields Extension

Use the Allocation Descriptive Flexfields extension to define descriptive flexfields to be used when defining allocation rules. The descriptive flexfields you define are used in creating allocation and offset transactions.

Description

Oracle Projects calls this extension before creating each transaction. If the extension provides descriptive flexfield values, the system uses the values when creating the transactions.

The extension includes the following items:

Item	Name
Body template	PAPALCCB.pls

Item	Name
Specification template	PAPALCCS.pls
Package	pa_client_extn_alloc
Procedure	txn_dff_extn

Procedure Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Allocation Dependencies Extension

Use the Allocation Dependencies extension to verify compliance with the business rules of your choice. For example, you could verify that certain projects or tasks are never included in a source pool, or that the previous allocation run used a particular rule.

Description

Oracle Projects calls this extension before processing any allocation rule. If the status code is zero (that is, if the dependencies specified in the extension are met) then the process creates an allocation run. If the status code is other than zero, the system prints the message provided by the x_message parameter.

The extension includes the following items:

Item	Name
Body template	PAPALCCB.pls
Specification template	PAPALCCS.pls
Package	pa_client_extn_alloc
Procedure	check_dependency

Parameters

The extension uses the following parameters:

Parameter	Usage	Type	Description
P_ALLOC_RULE_ID	IN	NUMBER	(Required) Identifies the allocation rule
X_STATUS	OUT NOCOPY	NUMBER	(Required) Indicates if an error occurred: =0 Successful validation <0 Oracle error; message is written to a log file >0 Application error
X_ERROR_MESSAGE	OUT NOCOPY	VARCHAR2(30)	Error message text

Related Topics

Allocations, *Oracle Project Costing User Guide*

Asset Allocation Basis Extension

This extension enables you to define your own allocation bases for allocating unassigned and common costs across multiple project assets.

The extension is identified by the following items:

Item	Name
Body template	PACCXAAB.pls
Specification template	PACCXAAS.pls
Package	pa_client_extn_asset_alloc
Procedure	asset_alloc_basis

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Business Rules

This extension is called by the PA_ASSET_ALLOCATION_PVT.ALLOCATE_UNASSIGNED procedure. It is called once for every *unassigned* asset line where the project (or batch) has an Asset Allocation Method equal to CE (Client Extension Basis). It enables you to determine the Total Basis Amount and the Asset Basis Amount for each asset in the array.

The p_asset_basis_table is passed to the Client Extension procedure. It is a table indexed by Binary Integer with three columns:

- PROJECT_ASSET_ID NUMBER;
- ASSET_BASIS_AMOUNT NUMBER
- TOTAL_BASIS_AMOUNT NUMBER

The table will already be populated with values for Project Asset ID, which correspond to the assets associated with the current *unassigned* asset line via Grouping Levels and Asset Assignments. The basis amount columns will contain zeros, which are then replace with values determined by this extension. The Total Basis Amount should be identical for each row in the table. You create the logic for determining the basis amounts for each asset.

Checks are performed on each project asset to verify that:

- Each project asset ID is valid for the project
- The Date Placed in Service is specified
- The Capital Hold flag is set to N, indicating that the asset is eligible for new asset line generation
- The Project Asset Type is AS-BUILT for capital asset lines (line type = C)
- The Project Asset Type is RETIREMENT_ADJUSTMENT for retirement cost asset lines (line type = R)

If you modify or add to assets in the P_ASSET_BASIS table, you must ensure that above conditions are true for each asset.

The following additional validations are also performed:

- The Total Basis Amount is not equal to zero (to avoid division by zero)
- Each Asset Basis Amount is not null and is not negative
- Each project asset in the array refers to the same Total Basis Amount
- The Asset Basis Amounts sum up to the Total Basis Amount

The Total Basis Amount is the sum of all Asset Basis Amounts in the table, and it is stored on each row. The asset allocation uses the Asset Basis Amount/Total Basis Amount for each project asset to prorate the amount of each *unassigned* asset line.

Asset Allocation Basis Procedure

The procedure name is *asset_alloc_basis.*

Use this procedure to define your own allocation bases for allocating unassigned and common costs across multiple project assets. Oracle Projects calls this procedure to allocate costs for projects that specify an asset cost allocation method of *Client Extension* in the Capital Information window.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Implementing Client Extensions, page 7-2

Allocating Asset Costs, *Oracle Project Costing User Guide*

Asset Assignment Extension

If the Generate Asset Lines process is unable to assign an asset to a task, the system marks the line as UNASSIGNED in the Asset Name column of the report.

Oracle Projects calls the Asset Assignment extension:

- For all unassigned assets. You can modify the extension to designate the assets for specific tasks (asset lines) and thus avoid the UNASSIGNED designation, or you can assign an asset to the line manually.
- If the Override Asset Assignment check box is selected on the Project Types window (Capitalization tab). You can modify the extension to override the asset assigned to specified tasks.

The asset you designate must:

- Be placed in service before the date identified by the In Service Through date in the Generate Asset Lines process
- Belong to the same project as the identified task

The extension includes an example that you can copy and modify.

Description

The extension includes the following items:

Item	Name
Body template	PAPGALCB.pls
Specification template	PAPGALCS.pls
Package	pa_client_extn_gen_asset_lines
Procedure	client_asset_assignment

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Validation

You can validate the asset identifier (asset_id) in the client extension body to avoid exceptions during the PRC: Generate Asset Lines process.

If you do not do the validation in the client extension body, the system validates the asset identifier after the extension returns it. The Generate Asset Lines exception report lists the lines that fail validation.

Related Topics

Generate Asset Lines, *Oracle Projects Fundamentals*

Asset Lines Processing Extension

This extension is called by the *PRC: Generate Asset Lines* process(for a Single Project or a Range of Projects) for each project for which asset lines are generated. You can use this extension to create project assets (capital assets and retirement adjustment assets) and asset assignments automatically prior to the creation of asset lines, based on transaction data (such as inventory issues or supplier invoices) entered for the project.

The extension includes the following items:

Item	Name
Body template	PACCXACB.pls
Specification template	PACCXACS.pls
Package	pa_client_extn_asset_creation
Procedure	create_project_assets

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Asset Lines Processing Procedure

The procedure name is: **create_project_assets**

When you submit the *PRC: Generate Asset Lines* process (for a Single Project or a Range of Projects), Oracle Projects calls this procedure for each project prior to creating asset lines. The intended use of this extension is to automatically create project assets (capital assets and retirement adjustment assets) and asset assignments prior to the creation of asset lines, based on transaction data (such as inventory issues or supplier invoices) entered for the project.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Implementing Client Extensions, page 7-2

Generating Summary Asset Lines, *Oracle Project Costing User Guide*

Generate Asset Lines, *Oracle Projects Fundamentals*

Capital Event Processing Extension

This extension is called by the *PRC: Create Periodic Capital Event* processfor each project for which a capital event is created. You can use this extension to create project assets (capital assets and retirement adjustment assets) and asset assignments automatically prior to the creation of capital events, based on transaction data (such as inventory

issues or supplier invoices) entered for the project.

The extension includes the following items:

Item	Name
Body template	PACCXCBB.pls
Specification template	PACCXCBS.pls
Package	pa_client_extn_pre_cap_event
Procedure	pre_capital_event

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Capital Event Processing Procedure

The procedure name is: *pre_capital_event*.

When you submit the *PRC: Create Periodic Capital Event* process, Oracle Projects calls this procedure for each project prior to creating a capital event. The intended use of this extension is to automatically create project assets (capital assets and retirement adjustment assets) and asset assignments prior to the creation of capital events, based on transaction data (such as inventory issues or supplier invoices) entered for the project.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Implementing Client Extensions, page 7-2

Creating Capital Events, *Oracle Project Costing User Guide*

Create Periodic Capital Events, *Oracle Projects Fundamentals*

Capitalized Interest Extension

The capitalized interest client extension enables you to customize the capitalized

interest calculation process.

The extension includes the following items:

Item	Name
Body template	PACINTXB.pls
Specification template	PACINTXS.pls
Package	pa_client_extn_cap_int

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Procedures

The following procedures are provided in the capitlized interest client extension.

You can view the parameters for these procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Target Task Override Procedure

The procedure name is get_target_task

The Target Task Override procedure enables you to redirect capitalized interest transactions to specific tasks.

Expenditure Organization Procedure

The procedure name is*expenditure_org.*

The Expenditure Organization procedure enables you to specify organizations other than the source project owning organization or source task owning organization as the expenditure organization for generated transactions.

Interest Rate Multiplier Override Procedure

The procedure name israte_multiplier.

The Interest Rate Multiplier Override procedure enables you to define multiple interest rate multipliers based on the rate name and task owning organization.

Interest Override Procedure

The procedure name is calculate_cap_interest.

The Interest Override procedure enables you to define your own calculations for capitalized interest.

Interest Threshold Procedure

The procedure name is*check_thresholds.*

The Interest Threshold procedure enables you to define duration and amount thresholds at levels lower than the operating unit.

Grouping Method Procedure

The procedure name is *grouping_method*. The Grouping Method procedure enables you to specify grouping criteria.

Get Transaction Attributes Procedure

The procedure name is *get_txn_attribute*. The Get Transaction Attributes procedure enables you to control how the transaction attribute columns are populated.

Related Topics

Implementing Client Extensions, page 7-2

Capitalizing Interest, *Oracle Project Costing User Guide*

Capitalized Interest, *Oracle Projects Implementation Guide*

CIP Grouping Extension

Use the CIP (Construction-In-Process) Grouping extension to define a unique method that your company uses to specify how expenditure lines are grouped to form asset lines.

Oracle Projects predefines five CIP Grouping Methods. If these methods do not meet your company's business needs, use this client extension to create your own CIP Grouping Method. Once the extension has been created, you can assign the grouping method to individual projects by selecting the "Group by Client Extension" grouping method in the Capitalization tab of the Project Types window.

Oracle Projects calls the CIP Grouping extension during the Generate Asset Lines process.

The extension is identified by the following items:

Item	Name
Specification template	PAXGCES.pls
Body template	PAXGCEB.pls
Package	pa_client_exten_cip_grouping
Function	client_grouping_method

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Client_Grouping_Method Function

You can view the parameters for this function in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Example of Using the Asset Line Grouping Extension

The body template, PAXGCEB.pls, includes a sample PL/SQL procedure for defining a CIP grouping method. The sample grouping method groups asset lines by material expenditures and non-material expenditures.

The sample procedure is shown below.

```
CREATE OR REPLACE
Package BODY PA_CLIENT_EXTEN_CIP_GROUPING
AS
FUNCTION CLIENT_GROUPING_METHOD(
p_proj_id IN PA_PROJECTS_ALL.project_id%TYPE,
p_task_id IN PA_TASKS.task_id%TYPE,
p_expnd_item_id IN PA_EXPENDITURE_ITEMS_ALL.expenditure_item_id%TYPE,
p_expnd_id IN PA_EXPENDITURE_ITEMS_ALL.expenditure_id%TYPE,
p_expnd_type IN PA_EXPENDITURE_TYPES.expenditure_type%TYPE,
p_expnd_category IN PA_EXPENDITURE_CATEGORIES.expenditure_category%TYPE,
p_attribute1 IN PA_EXPENDITURE_ITEMS_ALL.attribute1%TYPE,
p_attribute2 IN PA_EXPENDITURE_ITEMS_ALL.attribute1%TYPE,
p_attribute3 IN PA_EXPENDITURE_ITEMS_ALL.attribute1%TYPE,
p_attribute4 IN PA_EXPENDITURE_ITEMS_ALL.attribute1%TYPE,
p_attribute5 IN PA_EXPENDITURE_ITEMS_ALL.attribute1%TYPE,
p_attribute6 IN PA_EXPENDITURE_ITEMS_ALL.attribute1%TYPE,
p_attribute7 IN PA_EXPENDITURE_ITEMS_ALL.attribute1%TYPE,
p_attribute8 IN PA_EXPENDITURE_ITEMS_ALL.attribute1%TYPE,
p_attribute9 IN PA_EXPENDITURE_ITEMS_ALL.attribute1%TYPE,
p_attribute10 IN PA_EXPENDITURE_ITEMS_ALL.attribute1%TYPE,
p_attribute_category IN
PA_EXPENDITURE_ITEMS_ALL.attribute_category%TYPE,
p_transaction_source IN
PA_EXPENDITURE_ITEMS_ALL.transaction_source%TYPE)
return VARCHAR2 IS
v_grouping_method varchar2(2000);
v_material_flag pa_expenditure_types.attribute10%TYPE;
BEGIN
/*Assume CIP grouping method is by default made up of attribute 6 to
attribute
10 in the following order:8,9,10,6,7 */
v_grouping_method := p_attribute8||p_attribute9||p_attribute10||
p_attribute6||p_attribute7;

/* In addition, the grouping method may have either expenditure type or
material flag appended to it */

/* If you want to further classify the grouping method by material flag,
do the
following and comment the 'grouping by expenditure type' section*/
Select attribute10 into v_material_flag
From PA_EXPENDITURE_TYPES
Where expenditure_type = p_expnd_type;
if (v_material_flag is not null ) then
v_grouping_method := v_grouping_method || v_material_flag;
end if;

/* If you want to further classify the grouping method by Expenditure
Type,
uncomment the following and comment 'grouping by material
flag' section */
-- v_grouping_method := v_grouping_method || p_expnd_type

/* If grouping method is null then return ALL*/
IF v_grouping_method is null then
v_grouping_method := 'ALL';
end if;
return v_grouping_method;
----v_grouping_method stores the grouping method to be returned by the
function
```

```
EXCEPTION
WHEN OTHERS THEN
null;
END;
END PA_CLIENT_EXTEN_CIP_GROUPING;
/
commit;
exit;
```

Related Topics

Project Types: Capitalization Information, *Oracle Projects Implementation Guide*

Creating a Capital Asset in Oracle Projects, *Oracle Project Costing User Guide*

CIP Account Override Extension

You can use this extension to override the CIP account associated with an asset line and to specify a different account for posting CIP clearing amounts. This enables you to:

- Use accounts for clearing CIP amounts that are different from the accounts you use to account for CIP expenditures
- Preserve the original CIP cost account details

The extension includes the following items:

Item	Name
Body template	PACCXCOB.pls
Specification template	PACCXCOS.pls
Package	pa_client_extn_cip_acct_ovr
Procedure	cip_acct_override

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

CIP Account Override Procedure

The procedure name is*cip_acct_override*. Use this procedure to override the CIP account

associated with an asset line to specify a different account for posting CIP clearing amounts. Oracle Projects calls this procedure when you submit the PRC: Generate Asset Lines process.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Implementing Client Extensions, page 7-2

Creating and Preparing Asset Lines for Oracle Assets, *Oracle Project Costing User Guide*

Depreciation Account Override Extension

This extension, enables you to specify logic for deriving the depreciation expense account that is assigned to a project asset. The extension includes the following items:

Item	Name
Body template	PACCXDEB.pls
Specification template	PACCXDES.pls
Package	pa_client_extn_deprn_exp_ovr
Procedure	deprn_exp_acct_override

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

The procedure name is*deprn_exp_acct_override*. Oracle Projects calls this procedure during the update of the Assets and Asset Details windows, and during validation of asset information when you submit the PRC: Interface Assets process.

Before the PRC: Interface Assets process validates that the Depreciation Expense CCID is populated, it calls this extension if the Book Type Code and Asset Category are NOT NULL. If a valid value is returned, the value is updated on the project asset.

The extension calls a procedure that checks to see that the new value returned is a valid CCID for the current Chart of Accounts.

You can view the parameters for this procedure in the Oracle Integration Repository.

The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Implementing Client Extensions, page 7-2

Defining and Processing Assets, *Oracle Project Costing User Guide*

Interface Assets, *Oracle Projects Fundamentals*.

Cross-Charge Client Extensions

You can implement your business rules for various aspects of cross charge feature by using the following client extensions:

Provider and Receiver Organizations Override Extension, page 9-51

Cross Charge Processing Method Override Extension, page 9-52

Transfer Price Determination Extension, page 9-54

Transfer Price Override Extension, page 9-55

Transfer Price Currency Conversion Override Extension, page 9-57

Internal Payables Invoice Attributes Override Extension, page 9-58

Related Topics

Cost Accrual Identification Extension, page 10-34

Provider and Receiver Organizations Override Extension

You can use this client extension to enforce cross-charge rules at a higher level in the organization hierarchy than the level at which you assign resources and projects. Doing so provides a single place for you to enforce and maintain your business rules in all organizations in your enterprise.

The system identifies cross-charged transactions based on the provider and receiver organizations for the transaction. It derives default values for these organizations as follows:

- Provider organization: The expenditure organization or non-labor resource organization for usage transactions

- Receiver organization: The organization that owns the task to which the transaction is charged

To override the cross-charge identification, code this extension to use a higher level in the organization hierarchy to derive the appropriate provider and receiver organizations and then determine if a transaction is to be a cross-charged transaction.

When you run the cost distribution processes or use the Expenditure Items window to adjust cross-charged transactions, the system first identifies the default provider and receiver organizations for the transaction and then calls the extension.

Description

The extension is identified by the following items:

Item	Name
Body template	PACCIXTB.pls
Specification template	PAACCIXTS.pls
Package	PA_CC_IDENT_CLIENT_EXTN
Procedure	override_prvdr_recvr

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Validation

The system verifies the returned values to ensure that they are valid organizations within the business group.

Cross-Charge Processing Method Override Extension

You may have some custom business rules that help you identify how you want to process cross-charged transactions. You can use this extension to:

- Exclude certain cross-charged transactions from cross-charge processing
- Change the cross-charge method (for example, from Intercompany Billing to Borrowed and Lent accounting)

When you run a cost distribution process or use the Expenditure Items window to

adjust cross-charged transactions, the system does the following:

1. Identifies the transaction as a cross-charged transaction
2. Determines the cross-charge processing method (based on how you set up the cross-charge options)
3. Calls the extension so you can override the cross-charge processing method

Description

The extension is identified by the following items:

Item	Name
Body template	PACCIXTB.pls
Specification template	PACCIXTS.pls
Package	PA_CC_IDENT_CLIENT_EXTN
Procedure	override_cc_processing_method

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Prerequisites

The transaction must be a cross-charged transaction.

Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Validation

The system validates the value returned for the cross-charge code to ensure that it meets the following rules:

If the cross-charge type is...	The following processing methods are allowed:
Intra-Operating Unit (that is, within a single operating unit)	Borrowed and Lent None (no processing)
Inter-Operating Unit (that is, across operating units within a single legal entity)	Intercompany Billing Borrowed and Lent None (no processing)
Intercompany (that is, across legal entities)	Intercompany Billing None (no processing)

Transfer Price Determination Extension

Although your transfer price setup determines the transfer price used for cross-charged transactions, you may want to enforce different business rules occasionally.

The extension *determine_transfer_price* specifies a transfer price for the transaction being processed. If this extension returns a valid value for the transfer price, Oracle Projects uses that value as the transfer price instead of computing the transfer price. The Distribute Borrowed and Lent Amounts and the Generate Intercompany Invoice processes call this extension, before calling the standard transfer price determination routine.

For another type of transfer price extension, see: Transfer Price Override Extension, page 9-55.

Description

This extension is identified by the following items:

Item	Name
Body template	PAPTPRCB.pls
Specification template	PAPTPRCS.pls
Package	PA_CC_TP_CLIENT_EXTN
Procedure	determine_transfer_price

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Prerequisites

- Complete all the setup steps described in the Cross Charge - Intercompany Billing setup steps section in the Oracle Projects Implementation Checklist, *Oracle Projects Implementation Guide*.
- Run the cost distribution processes for new transactions or use the Expenditure Items window to perform cross-charge adjustments on existing transactions. Both processes identify cross-charge transactions.
- Run the processes PRC: Distribute Borrowed and Lent Amounts or PRC: Generate Intercompany Invoices to process transactions that are identified as cross charged and that require borrowed and lent or intercompany processing.

Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Validation

The system validates that you have provided a value for only one of the following output audit parameters:

- x_bill_rate
- x_bill_markup_percentage

Transfer Price Override Extension

Although your transfer price setup determines the transfer price used for cross-charged transactions, you may want to enforce different business rules occasionally. To do so, you can use the Transfer Price Override extension for a given transaction.

The extension (procedure) *override_transfer_price* overrides the transfer price for a transaction. After the Distribute Borrowed and Lent Amounts Process and Generate Intercompany Invoice Process compute the transfer price (as determined by the user setup in the Transfer Price Rules and Transfer Price Schedules windows), the processes call this extension.

For another type of transfer price extension, see: Transfer Price Determination

Extension, page 9-54

Description

This extension is identified by the following items:

Item	Name
Body template	PAPTPRCB.pls
Specification template	PAPTPRCS.pls
Package	PA_CC_TP_CLIENT_EXTN
Procedure	override_transfer_price

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Prerequisites

- Complete all the setup steps described in the Cross Charge - Intercompany Billing setup steps section in the Oracle Projects Implementation Checklist, *Oracle Projects Implementation Guide*.
- Run the cost distribution processes for new transactions or use the Expenditure Items window to perform cross-charge adjustments on existing transactions. Both processes identify cross-charge transactions.
- Run the processes PRC: Distribute Borrowed and Lent Amounts or PRC: Generate Intercompany Invoices to process transactions that are identified as cross charged and that require borrowed and lent or intercompany processing.

Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Validation

The system validates that you have provided a value for only one of the following

output audit parameters:

- x_bill_rate
- x_bill_markup_percentage

Transfer Price Currency Conversion Override Extension

Use this extension when you occasionally want to override the default attributes used to convert the transfer price from the transaction currency to the functional currency. The Distribute Borrowed and Lent Amounts and the Generate Intercompany Invoice Processes call the extension after the processes compute the transfer price. (The user setup in the Cross Charge tab in the Implementation Options window determines the default attributes used for the conversion.)

Description

The extension is identified by the following items:

Item	Name
Body template	PAPMCECB.pls
Specification template	PAPMCECS.pls
Package	PA_MULTI_CURR_CLIENT_EXTN
Procedure	override_curr_conv_attributes

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Prerequisites

- Complete all the setup steps described in the Cross Charge - Intercompany Billing setup steps section in the Oracle Projects Implementation Checklist, *Oracle Projects Implementation Guide*.
- Run the cost distribution processes for new transactions or use the Expenditure Items window to perform cross-charge adjustments on existing transactions. Both

processes identify cross-charge transactions.

- Run the processes PRC: Distribute Borrowed and Lent Amounts or PRC: Generate Intercompany Invoices to process transactions that are identified as cross charged and that require borrowed and lent or intercompany processing.

Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Validation

Oracle Projects validates that the values returned by the client extension meet all conversion requirements.

Internal Payables Invoice Attributes Override Extension

When using Intercompany or Inter-Project Billing, you must define organization controls using the Provider/Receiver Controls window. For each Provider and Receiver pair, you select the expenditure type and expenditure organization to use when creating the internal payables invoices. In order to further classify cost based on additional transaction information, you can use this client extension to override the payables invoice attributes.

Description

The extension is identified by the following items:

Item	Name
Body template	PACCINPB.pls
Specification template	PACCINPS.pls
Package	PA_CC_AP_INV_CLIENT_EXTN
Procedure	override_exp_type_exp_org

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL

Procedures, page 7-4.

Prerequisites

Complete the following actions before you use this extension:

- Complete all the implementation steps for cross charge and intercompany billing. See Oracle Projects Implementation Checklist, *Oracle Projects Implementation Guide*.
- Run the cost distribution process for the new transactions or use the Expenditure Items window to perform cross charge adjustments on existing transactions. Both processes identify cross charge transactions.
- Run the PRC: Generate Intercompany Invoices process to create receivables invoices for transactions that require intercompany processing.
- Run the PRC: Interface Intercompany Invoices to Receivables process to interface the intercompany invoices to Oracle Receivables.
- Run the PRC: Tieback Invoices from Receivables process to tie back the receivables invoices and create the internal payables invoices.

Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Validation

The system performs the following validations:

- The value of x_expenditure_type must be a valid expenditure type for the expenditure type class of the supplier invoice.
- The value of x_expenditure_organization_id must be a valid expenditure organization for the receiver operating unit.

Related Topics

Defining Provider and Receiver Controls, *Oracle Projects Implementation Guide*

10

Oracle Project Billing Client Extensions

This chapter describes the client extensions in the Oracle Project Billing application.

This chapter covers the following topics:

- Funding Revaluation Factor Extension
- Billing Cycle Extension
- Billing Extensions
- Cost Accrual Billing Extension
- Cost Accrual Identification Extension
- Labor Billing Extensions
- Non-Labor Billing Extensions
- Retention Billing Extension
- Automatic Invoice Approve/Release Extension
- Output Tax Extension
- Receivables Installation Override Extension
- AR Transaction Type Extension

Funding Revaluation Factor Extension

Use the Funding Revaluation Factor Client Extension to apply a funding revaluation factor to the funding backlog amount. This extension may also be used to implement escalation indices defined for a contract. The factor can increase or decrease the funding backlog amount subject to revaluation and is applied to the funding backlog amount in the funding currency.

The client extension is called for each project or task by agreement.

The extension is identified by the following items:

Item	Name
Body template	PAXBFRCB.pls
Specification template	PAXBFRCS.pls
Package	Pa_Client_Extn_Funding_Reval
Procedure	Funding_Revaluation_factor

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Billing Cycle Extension

You can use a billing cycle client extension to derive the next billing date for a project. To use a client extension, you must write the logic in a PL/SQL procedure and then store the procedure in the database.

To use the billing cycle extension for any project, you must set the project's Billing Cycle Type to *User-Defined*.

> **Note:** If a billing cycle extension used in the Invoice Generation Process returns a NULL value for the next billing date, the project will not be picked up for Invoice Processing.

The extension is identified by the following items:

Item	Name
Body template	PAXIBCXB.pls
Specification template	PAXIBCXS.pls

Item	Name
Package	pa_client_extn_bill_cycle
Procedure	get_next_billing_date

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Warning: Do not use the PL/SQL commands Commit and Rollback in your billing extension code. For the *get_next_billing_date* function, define the pragma RESTRICT_REFERENCES as WNDS, WNPS. For more information, refer to the *PL/SQL User's Guide and Reference Manual* .

The procedure pa_client_extn_bill_cycle.get_next_billing_date returns a value for the next billing date.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Billing Extensions

Billing extensions allow you to implement company-specific business rules to create automatic revenue and billing events. The Billing Extensions window requires you to specify either an amount or percentage when you assign the extension to a project type, project, or task.

These fields can be used as parameters in the billing extensions. The values for the parameters are available in the view PA_BILLING_EXTN_PARAMS_V. This view contains a single row that has all the conversion attributes used in the billing extension procedures.

With billing extensions, you can automatically calculate summary revenue and invoice amounts during revenue and invoice generation based on unique billing methods. These billing amounts are accounted for using events. Some examples of billing extensions you can implement are:

- Fee
- Surcharge

- Retention

This essay describes the implementation steps of billing extensions, as well as the processing of billing extensions and automatic events within Oracle Projects.

We also provide you with detailed information about designing and writing billing extensions, including information about public procedures and views you can use in your billing extensions to derive additional information. Finally, we provide you with information to help you test and debug billing extensions.

> **Warning:** The public procedures and views in the Oracle Projects billing extensions are intended for use *only* in billing extensions for the Generate Draft Revenue/Generate Draft Invoice process. These public procedures and views will not work standalone or in any other client extensions.

> **Warning:** Do not use the PL/SQL commands Commit and Rollback in your billing extension code.

Overview of Billing Extensions

To use the billing extension functionality, you must implement billing extensions and assign them to projects. Oracle Projects processes active billing extensions and accounts for the calculated revenue and invoice amounts.

Implementation

To implement your company-specific billing methods, you first design and write rules to calculate billing amounts using PL/SQL procedures. You then enter the billing extension definition in Oracle Projects to specify additional information (such as the procedure name to call) that is used by the revenue and invoice programs to process the extension.

Assignments

You define billing extensions in the Billing Assignments window and specify whether an amount or percentage is required for the extension when assigning the extension to a project type or task. Along with the amount and percentage, you can specify the currency and conversion attributes.

The values entered in the Billing Assignments window can be used in your billing extension by accessing the view pa_billing_extn_params_v. This view, which has a single row with all the conversion attributes, can be used to create multi-currency events with this extension. If you have custom code in your billing extension and want to use the parameters, you must update the extension.

Budget Type

You can specify which budget type to use as input to calculations that use budgeted amounts. If no value is given for budget type, the billing extension uses the Approved Cost Budget and/or Approved Revenue Budget. See: Retrieving Budget Amounts, page 10-24.

Processing

When you run the revenue or invoice processes, Oracle Projects looks for active billing assignments. When an assignment is found, the processes read the billing extension definition and call the appropriate procedure. If there are multiple active assignments for a project or task, Oracle Projects calls the extension in ascending order based on the processing order specified in the billing extension definition.

Oracle Projects executes top task level assignments once for each top task. Billing extensions assigned to the project and the project type are executed once for each project, except in the case of task level funding. If a project uses task level funding, Oracle Projects executes billing extensions assigned to the project and the project type, once for each authorized top task on the project.

Automatic Events

Your billing extension calculates revenue and invoice amounts and creates one or more *Automatic* events to account for the revenue and invoice amounts. Oracle Projects processes these events as it does other manually entered events. You can store audit amounts for these events in the audit columns of the Events table.

Automatic events are events having an event type classification of *Automatic*. With automatic events, you can increase or decrease revenue and invoice amounts. You can also independently specify revenue and invoice amounts for the events. If an event has both a nonzero revenue amount and a nonzero invoice amount, you must use the same sign for both amounts. Some examples of revenue and invoice amounts for these events are:

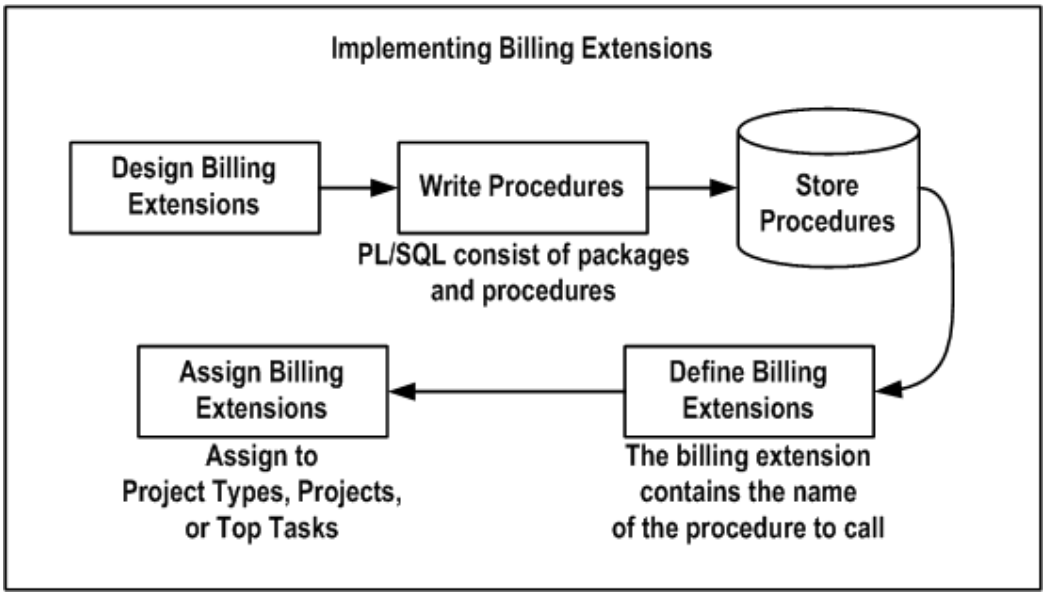
- Revenue = $100, Invoice = $0
- Revenue = $100, Invoice = $200
- Revenue = -$100, Invoice = -$100
- Revenue = $0, Invoice = -$100

The billing extension uses the public procedure MyPackageName.insert_event to create automatically created events. This is shown in the following table.

Item	Name
Body template	PAXITMPB.pls
Specification template	PAXITMPS.pls
Package	MyPackageName
Procedure	insert_events

Implementing Billing Extensions

The following illustration shows the steps required to implement billing extensions.



To implement billing extensions in Oracle Projects according to your company's method of doing business, perform the following steps.

Step 1: Design Billing Extensions

Carefully plan the definition of billing extensions before you begin writing them. Typically, the logic of your billing extensions are dependent on your company's implementation of Oracle Projects. Consider the following issues when designing your billing extensions:

- Logic of billing extensions

- Additional implementation data required

Step 2: Write and Store PL/SQL Procedures

After you design your billing extensions, write the PL/SQL procedures that define the logic of the billing extensions.

After you write your procedures, store them in the database and test them to ensure that your billing extension logic works as expected.

Step 3: Define Billing Extensions

Define your billing extensions, which specify the PL/SQL procedure name and additional information for Oracle Projects to use when processing billing extensions.

You use the Billing Extensions window to define billing extensions.

This step assumes that an event type has already been defined for the default event type. For a discussion of automatic events created by billing extensions, see: Automatic Events, page 10-5.

Step 4: Assign Billing Extensions to Project Types

Assign billing extensions to the appropriate project types if you have defined non-project-specific billing extensions. Your project users will assign the project-specific billing extensions to projects and top tasks as they define projects.

You use the Project Types form to assign billing extensions to project types.

Defining Billing Extensions

You define billing extensions to automatically calculate and create revenue and invoice amounts.

When you define billing extensions, you specify detailed information that determines when the billing extensions are called, which processes call them, and what information is required upon entry of the billing extension.

Some extensions are provided by Oracle Projects. These extensions are all marked with a checkmark in the Predefined flag check box. When this box is checked, it is not possible to change the contents of the following fields:

- Procedure
- Order
- Revenue Budget Type
- Calling Processes
- Required Inputs

- Other Parameters
- Calling Place

Fremont Corporation's Billing Extension for Communication Surcharge

Fremont Corporation defines one billing extension for communication surcharge. This billing extension calculates communication charge as a percent of the amount invoiced.

The following table shows the attributes of Fremont Corporation's billing extension.

Attribute	Value
Billing Extension Name	Communication Charge
Calling Process	Invoice
Default Event Type	Surcharge
Default Event Description	Communication Charge
Check Boxes Checked	Adjustment Processing Regular Processing Percentage Project Specific
Default Cost Budget Type	Approved Cost Budget
Default Revenue Budget Type	Approved Revenue Budget

Designing Billing Extensions

Before you begin designing billing extensions, you should familiarize yourself with the three classes of billing extensions to understand the complexity of the business problem you are trying to solve.

There are also specific questions of client extension design that are unique to determining the requirements and logic of your billing extensions. We list these questions in the pages that follow, and then address some of these issues in further detail in the Concepts of Billing Extension Definitionssection, page 10-11.

Understanding Billing Extensions Classes

There are three primary classes of billing extensions that you can write. The classes differ by how you calculate the revenue and invoice amounts:

Class 1: Revenue and Invoice Amounts

This class of billing extensions isbased on a function of the revenue and invoice amounts included on draft revenue and invoices

An example is a Surcharge billing extension, which is typically a percentage of the invoice amount. This is the simplest class of billing extension to design and write.

Class 2: Independent Values

This class of billing exctensions isbased on values independent of the amounts included on draft revenue and invoices.

An example is the percent complete revenue accrual method, which is based on the physical percent complete entered for the project multiplied by the budget revenue amount. The calculated amount is independent of other amounts included on the revenue and invoice. In many cases, this class of billing extensions may be the only method used to calculate revenue and invoice amounts for the project, particularly if you are using Event based revenue accrual and invoicing.

Class 3: Transaction Attributes

This class of billing extensions is based on the attributes of a group of transactions included on draft invoices, for which the billing extension calculates the amount to bill for these transactions.

For example, you may wish to calculate the revenue and invoice amounts based on number of days worked, rather than the actual hours worked which are recorded on the timecard. Another example is volume discounts on an invoice, in which you provide discounts based on the volume of transactions billed. You calculate the amount to bill for the group of transactions without specifying a bill amount for each transaction.

To properly track which individual transactions are billed using an automatic event, you must set up your projects to include these transactions on an invoice, but without an invoice amount. These transactions must have a nonzero revenue amount and a invoice amount of zero. Oracle Projects includes these transactions on the invoice on a net zero adjustment line which you cannot review in the forms, but that you can read from the database in your billing extension. You can set up a project to process transactions in this way by using different revenue and invoice burden schedules; the revenue schedule determines the appropriate revenue amounts and the invoice schedule calculates a invoice amount equal to zero.

Oracle Projects links the detail transactions to the invoice on a net zero adjustment invoice line, and you hold and account for the summary bill amount for these transactions using an automatic event included on the invoice. You can then write custom reports to list the detail transactions that backup the summary event amount.

You can only implement this class of billing extensions for invoicing amounts. You cannot use this class for revenue amounts calculated during revenue generation.

Planning Your Billing Extensions

You should carefully design billing extensions before implementing them in Oracle Projects. Careful planning of your billing extension helps to ensure that you are calculating and accounting for revenue and invoice amounts according to your company-specific rules. See: Designing Client Extensions, page 7-2.

You should consider the additional design issues for billing extensions:

- Are you calculating a revenue amount, an invoice amount, or both? Are the amounts generated during revenue accrual, invoice generation, or both?
- How are the amounts calculated? What are the inputs to the calculation?
- How are the inputs derived?
- How are the amounts processed: (1) for reporting purposes (2) for accounting purposes, (3) for invoicing?
- How are the attributes of the automatic event set: event type, event organization, event description, completion date?
- Under what conditions is this calculation used? What types of projects? What types of billing terms?
- How is the billing extension processed for adjustments? Adjustments are defined as revenue credits or invoice credit memos, based on other transactions.
- Can this billing extension be called with other billing extensions on the same project/task? If so, what is the dependency and order of your billing extensions?
- What is the exception handling if some input values cannot be found?
- How is the logic affected if the inputs change over time?
- Is there a limit on the amount calculated? If so, what is the logic?
- Are there implications of the level at which the project is funded - either the project level or the top task level? If so, what are they?

Once you answer these questions, you should have the appropriate information to define a billing extension in Oracle Projects and to document the functional specifications for your technical resource to use in writing the PL/SQL procedure.

Concepts in Billing Extension Definitions

When you enter billing extension definitions, you specify parameters that specify how your billing extension is processed in Oracle Projects. This section explains some of these parameters.

Calling Process

You specify if the billing extension is called by the revenue generation program, the invoice generation program, or both programs.

When you call billing extensions during revenue generation, you can create events with a revenue amount, or with a revenue amount and a bill amount, as long as the revenue amount is nonzero.

When you call billing extensions during invoice generation, you can create events with a bill amount, or with a revenue amount and a bill amount, as long as the bill amount is nonzero.

The following table shows examples of events with various revenue and bill amounts that you can create in the Generate Draft Revenue calling process.

Billing Extension	Event	Revenue Amount	Bill Amount	Comments
1	1	100	100	Bill amount is processed after the related revenue is distributed
2	2	100	-	Revenue event only

The following table shows examples of events that you can create in the Generate Draft Invoice calling process.

Billing Extension	Event	Revenue Amount	Bill Amount	Comments
3	1	100	100	Revenue amount is processed after the related invoice is released
4	2	-	100	Invoice event only

If you create an event with both revenue and bill amounts, the revenue amount and the bill amount do not have to be the same. You can create positive or negative event amounts with billing extensions.

You can create a billing extension that is called by both revenue generation and invoice generation. You would do this if your billing calculation is similar for both the revenue and bill amounts, with the exception that the event revenue amount is based on the accrued revenue, and the event bill amount is based on the amount invoiced. You can write your procedure to have the same logic for the calculation but to use the appropriate input of either accrued revenue or amount invoiced into your calculation. With this approach of writing one procedure and one billing extension, you can avoid duplication of your logic. In addition, your project users only need to assign one billing extension to their projects, instead of two billing extensions - one for revenue accrual and one for invoicing.

Calling Place: Revenue Generation Program

The revenue generation program calls client extensions during the following three processing steps:

- Revenue Deletion Processing
- Revenue Adjustment Processing
- Revenue Regular Processing

Revenue Deletion Processing

During revenue deletion, calls are made to the following billing extensions, in the order shown below:

- PRE Billing Extension
- DEL Billing Extension

Standard revenue processing is then performed, followed by the following billing extension call:

- POST Billing Extension

Revenue Adjustment Processing

During revenue adjustment, calls are made to the following billing extensions, in the order shown below:

- PRE Billing Extension

Standard adjustment revenue processing is then performed, followed by the following billing extension calls:

- ADJ Billing Extension
- POST Billing Extension

Regular Revenue Processing

- PRE Billing Extension

Regular revenue processing is then performed, followed by the following billing extension call:

- REG Billing Extension

Automatic revenue event processing is then performed, followed by the following billing extension call:

- POST-REG Billing Extension

Automatic revenue event processing is performed again, followed by the following billing extension call:

- POST Billing Extension

Calling Place: Invoice Generation Program

The invoice generation program calls client extensions during the following three processing steps:

- Invoice Deletion Processing (when using the delete & regenerate option only)
- Invoice Cancellation Processing (when using the cancel option only)
- Invoice Write-Off Processing (when using the write-off option only)
- Invoice/Credit Memo (Regular) Processing

Invoice Deletion Processing

During invoice deletion, when the delete and regenerate option is used, calls are made to the following billing extensions, in the order shown:

- Call PRE Billing Extension
- Call DEL Billing Extension

Standard delete invoice processing is then performed, followed by the following billing extension call:

- Call POST Billing Extension

Invoice Cancellation Processing

During invoice cancellation, when the cancel option is used, calls are made to the following billing extensions, in the order shown below:

- PRE Billing Extension

Standard delete invoice processing is then performed, followed by the following billing extension calls:

- CANCEL Billing Extension
- POST Billing Extension
- Approval/Release Billing Extension

Invoice/Credit Memo (Regular) Processing

During invoice and credit memo (regular) processing, calls are made to the following billing extensions, in the order shown below:

- PRE Billing Extension

Standard credit memo processing is then performed, followed by the following billing extension calls:

- ADJ Billing Extension
- POST Billing Extension
- PRE Billing Extension

Regular invoice processing is then performed, followed by the following billing extension call:

- REG Billing Extension

Automatic invoice event processing is then performed, followed by the following billing extension calls:

- POST-REG Billing Extension
- Approval/Release Billing Extension
- POST Billing Extension
- Validate Approval/Release Processing

Standard write-off invoice processing is then performed.

Extension Call Types

There are several predefined places within the revenue generation and invoice generation programs where your billing extension can be called when processing a project:

- Pre-Processing
- Delete Processing
- Cancel Invoice Processing
- Write-Off Invoice Processing
- Adjustment Processing
- Regular Processing
- Post-Regular Processing
- Post-Processing

The following list describes each of the calling places.

Pre-Processing Pre-processingbilling extensions are called before any revenue accrual or invoice calculations for a project. The Generate Draft Revenue and Generate Draft Invoices processes do not allow you to create automatic events in this calling place. An example of a preprocessing billing extension is to place all unbilled, unpaid supplier invoice items on hold, so that they are not billed; and to release the billing hold on any unbilled, paid supplier invoice transactions that are on hold. You can then bill the paid supplier invoice items during standard invoice processing.

Delete Processing Delete processingbilling extensions are called after revenue is billed and before any revenue accrual or invoice calculations for a project; this is only applicable to invoicing billing extensions The Generate Draft Invoices process does not allow you to create automatic events in this calling place.

Cancel Invoice Processing Cancel invoice processingbilling extensions are called after the invoice cancellation for a project. This is only applicable to invoice billing extensions. The Generate Draft Invoices process does not allow you to create automatic events in this calling place.

Write-Off Invoice Processing Write-off invoice processingbilling extensions are called after the invoice write-off processing for a project. This is only applicable to invoice billing extensions. The Generate Draft Invoices process does not allow you to create automatic events in this calling place.

Adjustment

Adjustment processing creates crediting revenue and invoices that credit existing revenue or invoices. Oracle Projects creates crediting revenues and invoices due to changes in revenue or invoice amounts or in the revenue general ledger account. These credits are created for one or more individual transactions which have previously been processed and included on a draft revenue or invoice; these changes in amounts or accounts result from adjustment actions on the individual transactions.

You can create automatic events in this step. If you transfer these events to Oracle Receivables for AutoInvoicing, link the automatic event invoice lines to their corresponding events in the original invoice. Oracle Projects calls a billing extension in this step after all of the crediting revenue and invoices are created.

Regular

Regular processing creates non-crediting revenue and invoices. Oracle Projects creates revenue and invoices based on individual transactions and events that have not previously been processed for revenue accrual and invoicing.

You can create automatic events in this step. Oracle Projects calls a billing extension in this step after all non-crediting revenues and invoices are created.

Post-Regular

Post-regularprocessing billing extensions create events based on all prior revenue generated in order to base the calculation on the total revenue accrued, including other automatic events. An example of a post-regular processing billing extension is cost accrual based on the revenue generated. See: Revenue-Based Cost Accrual, *Oracle Project Billing User Guide*.

Post-Processing

Post-processing billing extensions are called after all of the adjustment, regular, and post-regular processing is complete. The Generate Draft Revenue and Generate Draft Invoices processes do not allow you to create automatic events in this calling place. All of the revenue and invoice processing is complete before this step is executed. An example of a post-processing billing extension is to notify a project manager when an invoice greater than $25,000 is created.

The following table shows an example of the different automatic events created by using different calling places for a billing extension based on a percentage of the amount invoiced.

Period	Invoice Number	Invoice Credited	Invoice Amount	Automatic Event Amount (Regular and Adjustment)	Automatic Event Amount (Regular Only)
1	1		1000	100	100
2	2	1	-500	-50	
3		1500	150	100	
Summary:			2000	200	200

The billing extension called only during regular processing accounted for the total amount invoiced, including the credited amount during regular processing as illustrated by the event created for invoice number three.

Transaction Independent

Once you determine the inputs to your calculations, you can determine if your billing extension calculation is solely dependent on other transactions being processed, or if your calculation can be executed without any other transactions being processed. Transactions refer to expenditure items and events.

Transaction independent billing extensions are executed for each project with an active billing assignment, even if there are no transactions to process. This type of billing extension relies on an input other than billable transactions on a project. If this input changes, the calculated billing amount changes, which you want to record. For example, the cost-to-cost revenue accrual method, which relies on the budgeted cost and revenue amounts. If the budgeted cost or budgeted revenue changes, the revenue amount changes. You want to record this revenue amount change even if no other transactions are processed in revenue generation. This category includes the class of billing extensions that calculate revenue and invoice amounts based on values independent of the amounts included on draft revenue and invoices.

> **Note:** If you design a billing extension to be transaction independent, it will be executed in every run of the revenue or invoice processes.

Transaction dependent billing extensions are executed only if there are other transactions processed. An example of this type of billing extension is surcharge in which you calculate a percentage of the amount billed. You do not want to bill surcharge if no other transactions are billed.

Transaction dependent billing extensions are called only if billable expenditure items and events exist that need to be processed. For example, there may be new transactions that are set to Non-Billable, which are not going to generate any revenue or bill amount

and will not cause the billing extension to be called. This category includes billing extensions that calculate revenue and invoice amounts based on (i) a function of the revenue and invoice amounts included on draft revenue and invoices, or (ii) the attributes of a group of transactions included on draft invoices.

The following table shows an example of transaction dependent and transaction independent billing extensions. Billing extension 1, which is transaction dependent, calculates 10% of the invoice amount. Billing extension 2, which is transaction independent, bills $100 per period regardless of amount invoiced in that period.

Period	Invoice Number	Invoice Credited	Invoice Amount	Automatic Event Amount (Transaction Dependent)	Automatic Event Amount (Transaction Independent)
1	1		1000	100	100
2	2	1	-500	-50	
	3		1500	150	100
3	4		-	-	100
Summary:			2000	200	300

Relationship between Calling Place and Transaction Independent

The parameters for calling place and transaction independent are related.

You should call any transaction dependent billing extension in both regular and adjustment processing. This will ensure that all adjustments, including those that do not result in a new non-crediting amount, are properly accounted for. For example, you may have a non-billable adjustment which reverses amounts, but does not process any new non-crediting amounts.

You only need to call your transaction independent billing extension once during processing for a project, which can be done during regular processing. You typically do not call transaction independent billing extensions during adjustment processing.

The table below summarizes how you should set up the calling place and transaction independent parameters in your billing extension definition, based on the type of billing extension calculation.

Billing Extension Calculation	Regular	Adjustment	Transaction Independent
Based solely on transactions	Yes	Yes	No
Based on inputs other than transactions	Yes	No	Yes

There are exceptions to the general rule shown in the above table. You may define a billing extension as transaction dependent, but to be called only during regular processing. For example, you want to charge interest on outstanding invoices, but only want to include the interest on an invoice that has other transactions included on it. The interest calculation itself is a transaction independent calculation, but you define it as transaction dependent so that it is calculated only when other transactions are processed for an invoice. You do not want to create invoices with only an interest amount.

Project-Specific

You need to determine if your billing extension implements a company policy across projects or if it is applicable only to specific projects for which it is negotiated.

Project-specific billing extensions are those methods which are applicable only to specific projects for which they are negotiated. Project users assign these billing extensions to projects and top tasks; you cannot assign these billing extensions to project types.

Non-project-specific billing extensions are those methods which implement company policy across projects. You assign these billing extensions to project types; the billing extension applies to all projects of that project type. Project users cannot assign these billing extensions to projects.

> **Tip:** You can include conditional logic in your procedure to allow exceptions to project type rules.

Event Attributes

When designing billing extensions, you can specify the attributes of automatic events that are created by billing extensions. You can use the following default values or override the defaults for any of these attributes.

Event Attribute	Comments
Event Description	Default value is event description on billing extension.

Event Attribute	Comments
Event Type	Defaults value is event type on billing extension. Event type classification must be *Automatic*.
Event Organization	Default value is managing organization of project or task to which the event is assigned.
Completion Date	Accrue through date for events created during revenue generation, bill through date for events created during invoice generation.
Revenue Amount	For billing extensions called in revenue generation, must specify revenue amount. For billing extensions called in invoice generation, can optionally specify revenue amount; revenue amount is not processed until invoice on which the event is billed is released.
Bill Amount	For billing extensions called in invoice generation, must specify bill amount. For billing extensions called in revenue generation, can optionally specify bill amount; bill amount is not processed until revenue for the event is accrued.
Descriptive Flexfield Segments	Can pass any value as long as the value is valid with the descriptive flexfields you have defined for events.
Audit Columns in Events	For values used in billing extension calculations. NOTE: not displayed to the user, but available in the table.

Budget Attributes

When you design billing extensions, you can specify the attributes of budgets that are used by billing extensions. You can use the following default values or override the default values for any of these attributes.

Budget Attribute	Comments
Cost Budget Type Code	Default value is approved cost budget.
Revenue Budget Type Code	Default value is approved revenue budget.

Writing Billing Extension Procedures

Oracle Projects revenue and invoice generation programs call your billing extension procedures which define the logic to calculate and create automatic events according to your rules.

Your procedure can call other procedures or views. You can use predefined procedures and views, or you can write your own procedures. We discuss these predefined procedures and views in more detail in the pages that follow.

Procedure Template

The extension is identified by the following items:

Item	Name
Body template	PAXITMPB.pls
Specification template	PAXITMPS.pls

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

> **Note:** You cannot create project level events for projects using task level funding. You must write your billing extensions so that they work if they are called with or without the X_top_task_id parameter.

Views and Procedures You Can Use

Oracle Projects provides public, predefined procedures and views that you can use within your billing extension procedures for the Generate Draft Revenue and Generate Draft Invoice processes to derive amounts and create events. These procedures are created in a package named MyPackageName.

> **Note:** You cannot use the public billing extension procedures or views by themselves or from any other client extension.

In the pages that follow, we provide you with a description of each procedure, information about the parameters available for the procedure, and any additional information you need to use the procedure in your billing extension. Use these procedures and views to:

- Calculate amounts, page 10-22
- Identify transactions processed in the current run, page 10-22
- Insert events, page 10-23
- Retrieve budget amounts, page 10-24
- Handle error conditions, page 10-24

Calculating Amounts

Oracle Projects provides two views that you can use to identify detail expenditure items included on draft revenue and draft invoices processed in a given run. Use these views in your calculations for transaction dependent billing extensions. The views display the detail transactions processed for the context in which a billing extension is called, which consists of a project, a top task (if task level assignment), a calling place, and a request ID.

- PA_BILLING_REV_TRANSACTIONS_V (use this in procedures that are called during revenue generation)
- PA_BILLING_INV_TRANSACTIONS_V (use this in procedures that are called during invoice generation)

Identifying Process Run Information

Oracle Projects provides four views that you can use to identify the detail revenue and invoice transactions processed in the current run.

- PA_BILLING_REV_DELETION_V displays the draft revenues that will be deleted in the current draft revenue generation run. Use this view in the billing extension called during the deletion processing of revenue generation.
- PA_BILLING_REV_INV_DELETION_V displays the draft invoices that will be deleted in the current draft revenue generation run. Use this view in the billing extension called during the deletion processing of revenue generation.
- PA_BILLING_INV_DELETION_V displays the draft invoices that will be deleted in the current draft invoice generation run. Use this view in the billing extension called during the deletion processing of invoice generation.
- PA_BILLING_INV_PROCESSED_V displays the invoices that were processed in the

current run.

Inserting Events

Use the insert_events procedure to create automatic events in the events table. You must use this procedure when creating events using billing extensions, as it contains validation that ensures the data integrity of the events that you create.

If this procedure encounters an error, it displays an error message in the log file of the process that called the procedure and does not create an event.

The procedure name is *MyPackageName_pub.insert_event*. You can view descriptions of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Business Rules:

- If the billing extension creates a new automatic event from a transaction adjustment, the billing extension looks for the original event number (X_event_num_reversed). If the billing extension finds no value, you will receive the error message "You must have specified original event number for ADJ automatic event."

  Note: Oracle Projects provides a view that you can use to identify to original automatic event information of the current project, top task, and the credited invoices of the current request:

  - PA_BILLING_ORIG_EVENTS_V

- Currency attribute rules:
  - The transaction currency code is passed only if the bill transaction revenue or bill amount parameter is populated.
  - If the transaction currency code, rate, and amounts are not passed to the procedure, the procedure uses the project functional currency code and amounts.
  - If the transaction currency is the same as the project functional currency, the procedure ignores the rate type, rate date, and rate.
  - If transaction currency is different from the project functional currency and currency attributes are not passed, the procedure will use project defaults.

    Note: For a description of the currency conversion business rules, see: Setting Up Multi-Currency Billing, *Oracle Projects*

Implementation Guide.

Predefined Billing Extensions

The billing transaction currency of automatic events that are created by the predefined Percent Complete or Cost Accrual billing extensions is project functional currency.

Retrieving Budget Amounts

Use the get_budget_amount procedure to retrieve baselined budgeted cost or revenue amounts for use in your calculations.

The procedure name is *MyPackageName.get_budget_amount.*

You can view descriptions of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The parameters include input and output parameters for cost and revenue budget type codes.

You must specify a value for the *X2_project_id* parameter for this procedure. You can optionally use the X2_task_id parameter to derive the budget amount for a task.

Error Handling

Use the insert_message procedure to create debugging and error messages in the PA_BILLING_MESSAGES table. When you encounter a problem with billing extensions, you can review these messages in the log file of the revenue and invoice processes that call the billing extension, or you can review the error message table.

The name of this procedure is *MyPackageName.insert_message.*

You can view descriptions of the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Additional Considerations for Writing Procedures

You should understand the following issues and determine how they affect your PL/SQL procedure.

Hard Limits and Automatic Events

Oracle Projects processes automatic events as it does manual events. When events are processed for a project that is at the hard limit, only those events that fully fit under the hard limit are processed. If the event amount does not fully fit under the hard limit, it is created but not processed on a draft revenue or invoice until there is enough funding available. Deleting the revenue does not delete the event; however, regenerating the revenue creates a new duplicate event. Once you raise the hard limit, Oracle Projects

processes both events, which will lead to duplicate event amounts.

To avoid the creation of duplicate events, you can include logic in your billing extension to create an automatic event only if no unprocessed automatic events exist or if it will fit under the hard limit and be processed accordingly. Otherwise, the billing extension does not create the event, and you should delete the revenue without releasing it. If you do release the revenue, you need to calculate and insert the event manually.

In some transaction independent cases, you may wish to insert an amount that fits under the limit. In most transaction dependent cases, you should insert the entire amount, regardless of the limit to account for amounts based on processed transactions.

> **Tip:** If you are creating positive and negative event amounts, create the negative amount first, so that it increases available funding.

Multiple Customers and Automatic Events

Oracle Projects processes automatic events as it does manual events. With multiple customer projects, events are split between the customers based on the customer billing percentage.

If you include hard limit logic in your procedure, you need to consider multiple customers and hard limit processing.

Creating Multiple Events in Same Calling Place in Same Run

It is possible for one or more billing extensions to create events in the same calling place in the same run. All billing extensions are executed in the calling place before any of the automatic events are included on the invoice or revenue. You need to consider the issues in the case in which one billing extension is dependent on the amount of other events processed in that calling place in the same run.

For example, assume you are processing a surcharge extension and a retention extension in the regular processing section of invoice generation. The surcharge is executed before the retention based on the processing order of the billing extension definition. The surcharge event is created but is not yet included on the invoice. The retention extension relies on the total invoice amount. To get the total invoice amount, the retention extension must account for the surcharge event which is not yet included on the invoice.

You must include logic in your billing extension to read any automatic event created for projects and tasks in the same run and calling place.

Tips on Writing and Debugging Procedures

You can make testing and debugging your billing extension procedure much easier by writing your procedure in a very methodical, structured approach as suggested below. Your functional and technical resources should work together to validate the billing extension.

Step 1 : Create a Billing Extension to Create Event of a Given Amount

The first step is to create a very simple billing extension using the template files. You perform these steps to create an automatic event using a billing extension.

- Copy the template files to your own files
- Change the package and procedure names
- Add one call to the insert_event procedure to create an event of a given amount
- Store the procedure in the database
- Define a billing extension in Oracle Projects using this procedure
- Assign the billing extension to a *test* project
- Process the project through revenue and invoice generation; you should run the process that is appropriate for the billing extension
- Verify that an event is created for the given amount

Step 2: Test Each SQL Statement in SQL*Plus

After you verify that your billing extension works in an integrated flow, you can begin to build the logic of your billing extension. You first write and test each SQL statement in SQL*Plus. You focus on each SQL statement independently until you have verified all of the SQL statements.

> **Note:** Be sure that the appropriate SQL statements handle both project level and top task level billing assignments.

If you are writing transaction dependent billing extensions, you should create the appropriate transactions on your test project and then process the transactions through revenue accrual or invoicing. Note the request ID of the process. All of the transactions are marked with this request ID, so you can use the request ID in testing your SQL statements in SQL*Plus. You can then use one of the following views to read the appropriate transactions processed by the request ID.

- PA_BILLING_REV_TRANSACTIONS_V
- PA_BILLING_INV_TRANSACTIONS_V

The views use PL/SQL functions, which are included in the view definition, to determine the appropriate project, task, calling place, and request ID variables for which the billing extension is being run. These variables are set by the revenue generation and invoice generation processes before the billing extension is executed. If you do not set these variables, then the view returns all records for that project and task

in SQL*Plus. You can set these variables for your SQL*Plus session by running the papbglob.sql script. You can test your SQL statements using views with the variables that you want.

Step 3: Add SQL Statements One at a Time and Test in an Integrated Flow

After you test and verify each SQL statement that you plan to use in your billing extension, you can add one SQL statement at a time to your billing extension definition. Each time after you add a new part of the logic to the billing extension, you should then test your billing extension in an integrated revenue or invoice flow through Oracle Projects to verify the logic that you just added. Continue this cycle for all of your SQL statements to be included in your billing extension procedure.

You may take another approach by adding all of your logic to the billing extension and then performing integrated testing. This method is harder to debug when you encounter problems.

Step 4: Perform Full Integrated Testing of Billing Extension

After your billing extension logic is complete, you need to perform full integrated testing to validate all of the business cases and conditions that your billing extension must handle. This is where you use the business cases and test plans that you created in the design stage of the your billing extension implementation.

You must ensure that your billing extension works when using both project level and task level funding, if your company uses both levels of funding.

If you have written a transaction dependent billing extension, you should test the processing flow for these adjustment actions to ensure that your billing extension properly processes transactions with these adjustment actions:

- Revenue recalculation with and without change in the amount
- Transfer to the same project, which results in the same amount
- Transfer to a different task, which results in a different amount
- Split transaction
- Transfer to a different project
- Billable to non-billable reclassification

Once you have verified all of the integrated test cases, you have completed your billing extension implementation.

Other Debugging Tips

- Make sure that the name seeded in pa_billing_ extensions.procedure_name is exactly the same as the package.procedure_name if your procedure is stored in the

database

- Make sure that the package.procedure_name does not exceed 30 characters
- Make sure that your procedure is compiled and stored in the database
- Make sure that there is not another invalid or outdated procedure executing instead of the procedure you intend to execute. Inactivate all other extensions at the appropriate level to ensure that only the extension you expect to execute is executing.

Case Study: Surcharge

This case study demonstrates how to use a billing extension to add surcharges to project invoices.

Business Rule

The first step in the design process is to determine the business rule that you want to solve using client extensions.

Business Rule: Surcharge

Charge an additional surcharge to an invoice based on a percentage of the labor amount invoiced. This surcharge is referred to as *Communication Charge*.

Business Requirements

After you define the business rule you want to solve using client extensions, list the business requirements behind the business problem. This will help ensure that you are acknowledging all of the aspects of the business problem during the design stage.

- The surcharge is applicable only for projects for which it is negotiated. Project users specify the communication charge when they record the billing terms during project setup.
- You calculate this surcharge as follows:
  - *Surcharge = Surcharge Percentage Labor Amount Invoiced*
- Usually, the percentage is 2%. However, some project managers are beginning to negotiate 2.5% or 3% surcharges.

Required Extensions

You have determined that you will create a **billing extension** to automatically handle the Communication Charge within the invoicing cycle.

Tip: To review the sample PL/SQL code that corresponds to the implementation of this case study, view the file PAXITMPS.pls.

Additional Implementation Data

You must define additional data for this billing extension which includes the following:

- Event type of *Surcharge* with an event type classification of Automatic
- Descriptive flexfield segment on the Communication Charge billing assignments to hold the event description that users can enter to override the default description
- Descriptive flexfield segment on the Communication Charge billing extension to hold the corporate default percentage for communication charge

In addition, you must include the steps to enter a communication charge for projects in your company's procedures manual.

Design Requirements

You must consider and answer these additional questions for your billing extension.

Revenue or Invoice Amount?

Are you calculating a revenue amount, an invoice amount, or both? Are the amounts generated during revenue accrual, invoice generation, or both?

- The Communication Surcharge generates only an invoice amount during the invoice generation process. There is no effect on revenue.

How is the Amount Calculated?

What are the inputs to the calculation?

Surcharge = Surcharge Percentage X Labor Invoiced

What is the Calling Place?

This billing extension is called in both Regular and Adjustment processing, to account for regular transactions and for revenue and invoice credits.

How are the Inputs Derived?

- Surcharge Percentage is entered by a project user who defines the billing terms of the project. This will be entered on the billing assignment. If the percent is not specified, read the corporate default from the descriptive flexfield.
- Labor Amount Invoiced is the labor bill amount on an invoice, excluding overtime billed on the invoice.

How is the Amount Processed?

You need to determine how the amounts are processed for different purposes: 1) for reporting purposes (2) for accounting purposes, (3) for invoicing?

- There are no special reporting requirements
- There is no special accounting effect for an invoicing event.
- The default event description for the billing extension is *Communication Charge*. The project users can override the value by setting the optional descriptive flexfield segment called 'Event Description', which will be used to override the default event description.

Automatic Event Attributes?

You need to determine the various attributes of the automatic event, including: event type, event organization, event description, completion date.

- The event uses the default event type of *Surcharge* from the billing extension definition.
- The event organization is defaulted to the project or task organization. This organization is not used in processing or reporting these events.
- The event description is set as noted in the previous question.
- The completion date is set to the bill through date of the invoice.

When is the Surcharge Billing Extension Used?

Under what conditions is this calculation used? What types of projects? What types of billing terms?

- The communication surcharge is applicable for all projects for which it is negotiated.

How is the Billing Extension Processed for Adjustments?

Adjustments are defined as revenue credits or invoice credit memos, based on other transactions.

- The surcharge must be accounted for on all invoices and invoice credit memos.

Can This Billing Extension be Called with other Billing Extensions?

Can this billing extension be called with other billing extensions on the same project/task? If so, what is the dependency and order of your billing extensions?

- A project can have a communication surcharge along with other billing extensions.

The communication surcharge must be processed before the other billing extensions.

What is the Processing if Some Input Values Cannot be Found?

- If no percentage is specified on the billing assignment, use the corporate default value of 2%. This default value is held on the billing extension definition in a descriptive flexfield.

- If no labor is billed, then no surcharge is billed.

How is the Logic Affected if the Inputs Change?

- The surcharge percentage could change, but the user must disable the existing billing assignment and enter a new billing assignment with a new percentage. This new percentage is then automatically processed.

Is there a Limit on the Amount Calculated?

Is there a limit on the amount calculated? If so, what is the logic?

- There is no specific limit on the communication charge.

Funding Level?

Are there implications of the level at which the project is funded - either the project level or the top task level? If so, what?

- There are no special implications.

Billing Extension Definition

With the answers from these questions and your understanding of the billing extension definition, you can specify the billing extension definition of Communication Charge. An example is shown below.

> **Note:** The Percentage is not a required input for every billing assignment of Communication Charge, because there is a corporate default percentage that will be used when project users do not enter a negotiated percentage.

> **Tip:** You can use the same PL/SQL procedure for another billing extension that uses the same logic of adding a surcharge based on a percentage multiplied by the labor amount invoiced.

Example of a Surcharge Billing Extension

The following table shows attributes of a sample surcharge billing extension.

Attribute	Value
Billing Extension Name	Communication Charge
Procedure	pa_demo_surcharge.execute
Description	Calculate surcharge to invoice based on percentage of labor invoiced
Order	20
Default Event Type	Surcharge
Default Event Description	Communication Charge
Calling Place: Revenue	No
Calling Place: Invoice	Yes
Calling Place: Preprocessing	No
Calling Place: Adjustment	Yes
Calling Place: Regular	Yes
Calling Place: Post-Processing	No
Required Input: Amount	No
Required Input: Percentage	No
Product-Specific	Yes
Transaction Independent	No

Testing

You specify the following test cases to use in testing your billing extension procedure.

Scenario	Run	Inv Num	Inv Num Credited	Inv Amt	Invoice Labor Amt	%	Comm Charge Amt
No labor invoiced	1	1		1000	0	2	0
Credit memo	2	2	1	-500	0	2	0
Labor invoiced for first time		3		12000	10000	2	200
Credit memo due to rate change	3	4	3	-5000	-5000	2	-100
Labor with new bill rates		5		6000	6000	2	120
Communication Charge % was changed	4	6		5000	5000	3.5	175
Totals				18500	16000		395

You now have all of the components of your functional design to give to your technical resource for writing the PL/SQL procedures.

Related Topics

Designing Client Extensions, page 7-2

Event Types, *Oracle Projects Implementation Guide*

Defining Project Types, *Oracle Projects Implementation Guide*

Cost Accrual Billing Extension

You can use the cost accrual billing extension client extension to apply your company's business rules to your cost accrual procedures.

The extension includes the following items:

Item	Name
Body template	PAXICOSB.pls

Item	Name
Specification template	PAXICOSS.pls
Package	PA_REV_CA

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

You can view the parameters for the following procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

For more information about using the Cost Accrual Extension, see Revenue-Based Cost Accrual, *Oracle Project Billing User Guide.*

Calculation Procedure

The calculation procedure (calc_ca_amt) is the main procedure for calculating and generating the cost accrual entries.

PSI Cost Accrual Procedure

The PSI cost accrual procedure (get_psi_cols) displays the cost accrual columns in Project Status Inquiry.

Verify Project Status for Cost Accrual Procedure

The name for this procedure is *verify_project_status_ca.* This procedure is called when a user changes a project's status.

Check Cost Accrual Procedure

The name for this procedure is *check_if_cost_accrual.* This procedure checks whether a project has cost accrual, and sets the variables from attribute columns 11 through 15 of the billing extension.

Cost Accrual Identification Extension

Use this extension to identify cross charged projects that use cost accrual during

revenue generation. See: Revenue-Based Cost Accrual, *Oracle Project Billing User Guide* and Generate Draft Revenue, *Oracle Projects Fundamentals*.

The extension includes the following items:

Item	Name
Body template	PAICPCAB.pls
Specification template	PAICPCAS.pls
Package	PA_CC_CA
Procedure	identify_ca_projects

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Labor Billing Extensions

Labor billing extensions allow you to derive labor billing amounts for individual labor transactions. You can use labor billing extensions to implement unique labor billing methods. Some examples of labor billing extensions you may define are:

- Bill overtime premium hours at cost
- Bill based on volume of work performed

The Labor Billing Extensions is called during the revenue generation process to determine labor revenue and billing amounts.

The extension is identified by the following items:

Item	Name
Body template	PAXICTMB.pls

Item	Name
Specification template	PAXICTMS.pls
Package	PA_Client_Extn_Billing
Procedure	Calc_Bill_Amount

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Business Rules

Oracle Projects processes labor billing extensions for activity based billing during revenue generation. During processing, if Oracle Projects encounters a transaction that has a derived bill amount from a labor billing transaction, it skips the standard bill amount and rate calculation section of the revenue process for that transaction.

Consider the following design issues for labor billing extensions:

- What are the conditions and circumstances in which you cannot use the standard, activity based billing methods (identified by the WORK distribution rule) supported by Oracle Projects?
- How is the bill amount calculated in these cases?
- How do you identify labor transactions that meet these conditions?
- How do you store rates and other information that your calculations may require? How are the rates and other information maintained?
- What are the exception conditions for your labor billing extension? What is the exception handling if you cannot find a rate that should exist?

Calculate Bill Amount

The procedure name is *PA_Client_Extn_Billing.Calc_Bill_Amount*.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Following is additional information about parameters for this procedure.

Amount

- No value is passed in to the x_amount parameter. Do not expect an amount in this parameter when you create calculations in the extension.
- The client extension must assign a value to the parameter x_amount, or else the extension will be ignored by the calling program.

Bill Rate

Return one of the following values as the x_bill_rate_flag parameter value to specify if the amount that you have derived is based on a bill rate or a percent markup:

- B (specifies bill rate)
- null or value other than B (specifies markup)

If you specify that your amount is based on a bill rate, Oracle Projects populates the bill rate of the expenditure item by dividing the bill amount by the number of hours. If you specify that your amount is a markup, Oracle Projects does not set the bill rate.

Markup Percentage

If you specify that your amount is based on markup, you should populate x_markup_percentage with the markup percentage amount, so that the expenditure item record will contain accurate data.

Status

Use the x_status parameter to handle error conditions for your procedure. This parameter indicates the processing status of your extension as follows:

x_status = 0

The extension executed successfully.

x_status < 0

An Oracle error occurred and the process did not complete. Oracle Projects writes an error message to the process log file and rolls back the transactions processed for the entire project.

x_status > 0

An application error occurred. Oracle Projects writes a rejection reason to PA_EXPENDITURE_ITEMS.REV_DIST_REJECTION_CODE and does not mark items as revenue distributed. You can review the rejection reason in the revenue generation exception report.

Related Topics

Revenue Flow, *Oracle Project Billing User Guide*

Non-Labor Billing Extensions

Non-labor billing extensions enable you to derive labor billing amounts for individual non-labor transactions. You can use non-labor billing extensions to implement unique non-labor billing methods. Some examples of non-labor billing extensions you can define are:

- Tiered pricing method
- External system rate derivation

The Non Labor Billing Extension is called during the revenue generation process to determine non-labor revenue and billing amounts. The extension is identified by the following items:

Item	Name
Body template	PAXINCTB.pls
Specification template	PAXINCTS.pls
Package	pa_non_labor_bill_clt_extn
Procedure	calc_bill_amount

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database.

Business Rules

Oracle Projects processes non-labor billing extensions for activity based billing during revenue generation. During processing, if Oracle Projects encounters a transaction that has a derived bill amount from a non-labor billing transaction, it skips the standard bill amount and rate calculation section of the revenue process for that transaction.

Consider the following design issues for non-labor billing extensions:

- What are the conditions and circumstances under which you cannot use the standard, activity-based billing methods (identified by the WORK distribution rule) supported by Oracle Projects?

- How is the bill amount calculated in these cases?
- How do you identify labor transactions that meet these conditions?
- How do you store rates and other information that your calculations require? How are the rates and other information maintained?
- What are the exception conditions for your non-labor billing extension? What is the exception handling if you cannot find a rate that should exist?

Calculate Bill Amount

The procedure name is Pa_Non_Labor_Bill_Clt_Extn.Calc_Bill_Amount.

Information About Parameters

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Following is additional information about parameters for this procedure.

- **Using Bill Rate:** Return one of the following values as the x_bill_rate_flag parameter value to specify if the amount that you have derived is based on a bill rate or a percent markup:
  - B (specifies bill rate)
  - null or value other than B (specifies markup)

  If you specify that your amount is based on a bill rate, Oracle Projects populates the bill rate of the expenditure item by dividing the bill amount by the number of hours. If you specify that your amount is a markup, Oracle Projects does not set the bill rate.

- **Using Status:** Use the x_status parameter to handle error conditions for your procedure. This parameter indicates the processing status of your extension as follows:
  - **x_status = 0** The extension executed successfully.
  - **x_status < 0** An Oracle error occurred and the process did not complete. Oracle Projects writes an error message to the process log file and rolls back the transactions processed for the entire project.
  - **x_status > 0** An application error occurred. Oracle Projects writes a rejection reason to PA_EXPENDITURE_ITEMS.REV_DIST_ REJECTION_CODE and does not mark items as revenue distributed. You can review the rejection reason in the revenue generation exception report.

Related Topics

Revenue Flow, *Oracle Project Billing User Guide*

Retention Billing Extension

Use this extension define your company's business rules to bill withheld amounts. If you use this extension, the invoice generation process selects projects that have met the conditions defined in the extension and have a net retention balance that has not been billed.

The extension is identified by the following items:

Item	Name
Body template	PAXBRTCB.pls
Specification template	PAXBRTCS.pls
Package	pa_client_extn_retention
Procedure	BILL_RETENTION

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Retention Billing, *Oracle Project Billing User Guide*

Automatic Invoice Approve/Release Extension

The Automatic Invoice Approve/Release Extension allows you to make automatic approval and release of invoices a part of the Generate Draft Invoice process.

The extension is identified by the following items:

Item	Name
Body template	PAXPIACB.pls
Specification template	PAXPIACS.pls
Package	pa_client_extn_inv_actions
Procedures	approve_invoice, release_invoice

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Business Rules

Oracle Projects calls the Automatic Invoice Approve/Release Extension during invoice generation. During processing, if the extension returns an approval flag or release flag set to *yes*, then the process approves (and releases, if applicable) the invoice.

You must determine to what extent the Automatic Invoice Approve/Release Extension will be used across your projects. We recommend that you consider these design issues:

- What are the conditions and circumstances that require your project invoices to be automatically approved?
- What are the conditions and circumstances that require your project invoices to be automatically approved and released?
- What types of projects need to have this feature implemented?

Information About Parameters

You can view the parameters for these procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Following is additional information about parameters for this client extension.

x_invoice_class

The valid values of x_invoice_class are:

Value	Description
INVOICE	regular invoice
CREDIT_MEMO	crediting invoice
WRITE_OFF	write-off invoice
CANCEL	canceling invoice

x_status

Use the x_status parameter to handle error conditions for your procedure. This parameter indicates the processing status of your extension as follows:

Value	Description
x_status = 0	The extension executed successfully.
x_status < 0	An Oracle error occurred and the process did not complete. Oracle Projects writes an error message to the process log file.
x_status > 0	An application error occurred. Oracle Projects writes a rejection reason to the PA_DISTRIBUTION_WARNINGS table. The invoice is not approved or released.

Output Tax Extension

You set up a hierarchy for Oracle Projects and the project operating unit in the application tax options of Oracle E-Business Tax. The Generate Draft Invoices process uses the Application Tax Options hierarchy to determine the default tax classification codes on invoice lines. The Output Tax client extension is one of the default tax options in the Application Tax Options hierarchy.

The Generate Draft Invoices process calls the Output Tax extension if it does not find the default tax classification code from the other tax options you defined in the Application Tax Options hierarchy. You can use the extension to satisfy your business rules in assigning the default tax classification code for invoice lines.

The extension is identified by the following items:

Item	Name
Specification template	PAXPOTXS.pls
Body template	PAXPOTXB.pls
Package	pa_client_extn_output_tax
Procedure	get_tax_codes

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

The name for this procedure is get_tax_codes. The get tax codes procedure assigns a tax classification code to an invoice line.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Setting Up Tax for Oracle Project Invoices in Oracle E-Business Tax, *Oracle Projects Implementation Guide*

Oracle E-Business Tax User Guide

Receivables Installation Override Extension

The Receivables Installation Override client extension enables you to use a third-party receivables system for the majority of your receivables functionality, yet have the ability to import customer data from Oracle Receivables. Without this client extension, you can only import customer data with a full installation of Oracle Receivables.

The extension is identified by the following items:

Item	Name
Specification template	PAPARICS.pls

Item	Name
Body template	PAPARICB.pls
Package	pa_override_ar_inst
Procedure	get_installation_mode

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Business Rules

To use this extension, you must complete a *full* installation of Oracle Receivables, then override the installation mode to *shared*, using the Receivables Installation Override extension.

> **Warning:** Do not override a shared Receivables installation to full installation mode. This client extension is only intended for overriding a full installation to shared mode.

The following conditions exist when you override the installation to shared mode:

- The Tax Code fields are disabled in all windows where they appear.
- The GL date for receivables invoices is calculated based on GL periods, rather than Oracle Receivables periods.

If you override the Receivables installation, you can use function security to disable functions that are not available with a standard shared Receivables installation, such as *Invoice: AR Invoice* (drill down to Oracle Receivables to view an invoice).

> **Warning:** You must disable the Invoice: Write-Off function, as attempting to create write offs will cause processing problems.

This extension is called by the Interface Invoices to Receivables process.

Get Installation Mode

The get_installation_mode procedure returns an installation mode to the calling program.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Modifying the Get Installation Mode Procedure

The default procedure includes the following PL/SQL statement:

```
x_ar_inst_mode := p_ar_inst_mode
```

To override your full installation of Oracle Receivables to a shared mode, replace the statement above with the following statement:

```
x_ar_inst_mode := 'S'
```

AR Transaction Type Extension

The AR Transaction Type Extension enables you to determine the AR transaction type when you interface invoices to Oracle Receivables.

Oracle Projects calls the AR Transaction Type Extension during the Transfer Invoices to Oracle Receivables process.

The extension is identified by the following items:

Item	Name
Body template	PAXPTRXB.pls
Specification template	PAXPTRXS.pls
Package	pa_client_extn_inv_transfer
Procedure	get_ar_trx_type

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Get AR Transaction Type

The name for this procedure is pa_client_extn_inv_transfer.get_ar_trx_type.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Additional Information About Parameters

Following is additional information about the parameters for this extension.

x_invoice_class

The valid values of x_invoice_class are:

Value	Description
INVOICE	regular invoice
CREDIT_MEMO	crediting invoice
WRITE_OFF	write-off invoice
CANCEL	canceling invoice

x_status

Use the x_status parameter to handle error conditions for your procedure. This parameter indicates the processing status of your extension as follows:

Value	Description
x_status = 0	The extension executed successfully.
x_status < 0	An Oracle error occurred and the process did not complete. Oracle Projects writes an error message to the process log file.
x_status > 0	An application error occurred. Oracle Projects writes a rejection reason to the PA_DISTRIBUTION_WARNINGS table. The invoice is not approved or released.

11

Oracle Project Resource Management Client Extensions

This chapter describes the client extensions in the Oracle Project Resource Management application.

This chapter covers the following topics:

- Assignment Approval Changes Extension
- Assignment Approval Notification Extension
- Candidate Notification Workflow Extension

Assignment Approval Changes Extension

This client extension enforces the following conditions to determine whether an approval is required for an assignment:

- Change in duration

  A change in the dates of an assignment requires approval, because it affects the schedule and availability of the resource.

- Change in work type

  A change in the work type on an assignment can affect the billability and utilization percentage of the resource and therefore requires approval.

- Change in transfer price rate override values

  A change in the transfer price rate override, transfer price currency override, transfer price basis override, and transfer price applied percent override requires an approval, because it changes the transfer price of the resource.

The default project assignment approval workflow process calls the assignment approval changes extension.

The extension is identified by the following items:

Item	Name
Body template	PARAAPCB.pls
Specification template	PARAAPCS.pls
Package	pa_client_extn_asgmt_apprvl
Function	is_asgmt_appr_items_changed

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

Changed Approval Items Function

The function name isis_asgmt_appr_items_changed. This function returns a VARCHAR2 value (either Y or N) to indicate whether approval items have been changed.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Implementing Client Extensions, page 7-2

Assignment Approval Notification Extension

You can use this client extension to customize the list of default contacts (recipients) used by the assignment approval workflow.

The default project assignment approval workflow process calls the assignment approval notification extension.

The extension is identified by the following items:

Item	Name
Body template	PARAWFCB.pls
Specification template	PARAWFCS.pls
Package	pa_client_extn_asgmt_wf

Important: Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

You can view the parameters for these procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Generate Assignment Approvers

The procedure name is generate_assignment_approvers**.**

This procedure generates a list of approvers for the assignment. Oracle Projects sends the list of default approvers to this procedure. The procedure then makes user-requested changes and provides a modified list accordingly.

Approvers added through this process are not visible on the Assignment Approver page. However, users can see the name of the current approver on the Assignment Details page.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Generate Notification Recipients

The procedure name is generate_nf_recipients**.**

This procedure generates a list of recipients for notifications. Oracle Projects sends the list of default approvers to this procedure. The procedure makes user-requested changes and returns a modified list.

This procedure is used by the following FYI notifications:

- Assignment Approval Notification
- Assignment Rejection Notification

- Assignment Cancellation Notification

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Set Timeout and Reminders

The procedure name is set_timeout_and_reminders**.**

This procedure provides the reminder parameters, such as the waiting period between reminders and the number of reminders that are issued before the workflow process is canceled.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Implementing Client Extensions, page 7-2

Candidate Notification Workflow Extension

You can use this client extension to customize the list of people who receive a notification from the PA: Candidate Notification Process Workflow.

The extension is identified by the following items:

Item	Name
Body template	PARCWFCB.pls
Specification template	PARCWFCS.pls
Package	pa_client_extn_cand_wf

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

The USERS_LIST_TBLTYP parameters for this package are shown in the following table:

Parameter Name	Required	Data Type	Description
USER_NAME	Yes	VARCHAR2	The workflow user name of the approver
PERSON_ID	Yes	NUMBER	The person ID of the approver
TYPE	Yes	VARCHAR2	The type of user, such as RESOURCE_MANAGER or PRIMARY_CONTACT
ROUTING_ORDER	No	NUMBER	The order in which the approvals should be submitted. (For FYI notification recipients, this value is ignored because such notifications are sent to all recipients at the same time.)

Generate Notification Recipients

This package contains the procedure generate_nf_recipients**.**

This procedure generates a list of recipients for the various notifications. Oracle Projects sends the list of default approvers to this procedure. The procedure makes changes and provides a modified list. This procedure is used by the FYI notification Candidate Nominated Notification.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Implementing Client Extensions, page 7-2

12

Oracle Project Management Client Extensions

This chapter describes the client extensions in the Oracle Project Management application.

This chapter covers the following topics:

- Workplan Workflow Extension
- Progress Management Extension
- Budget Calculation Extensions
- Budget Verification Extension
- Budget Workflow Extension
- Estimate to Complete Generation Method Extension
- Control Item Document Numbering Extension
- Issue and Change Workflow Extension
- Project Status Report Workflow Extension
- Custom Performance Measure Extension
- Project Performance Status Extension
- Project Status Inquiry (PSI) Extension
- Project Status Inquiry Burdening Commitments Extension
- Project Status Inquiry Commitment Changes Extension

Workplan Workflow Extension

The workplan workflow extension enables you to customize the workflow processes for submitting, approving, and publishing a workplan.

You must determine how you want to submit, approve, and publish the workplan. See

Creating and Updating Workplans, *Oracle Project Management User Guide*.

The default workplan workflow process calls the workplan workflow extension.

The extension is identified by the following items:

Item	Name
Body template	PAXSTWCB.pls
Specification template	PAXSTWCS.pls
Package	pa_workplan_workflow_client

You can view the parameters for the following procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Start Workflow Procedure

The procedure name is *start_workflow*.

This procedure starts the workflow process for a workplan.

Select Approver Procedure

The procedure name is *select_approver*.

This procedure determines the approver for the workplan approval process.

Set Notification Party Procedure

The name of this procedure is *set_notification_party*.

This procedure determines which users receive workflow notifications when a workplan is submitted, approved, rejected, or published.

Related Topics

Designing Client Extensions, page 7-2

Progress Management Extension

The Progress Management client extension overrides the default method of deriving actual and estimated dates for lowest tasks and task assignments at any structure level.

The extension is identified by the following items:

Item	Name
Body template	PAPCTCXS.pls
Specfication template	PAPCTCXB.pls
Package	pa_progress_client_extn
Procedure	get_task_res_override_info

The name of the procedure is *get_task_res_override_info.*

This procedure overrides the default method to calculate actual and estimated dates for lowest level tasks and task assignments at all workplan structure levels. It runs for all lowest tasks and task assignments whenever you:

- Submit progress for a lowest task
- Submit progress for a task assignment
- Run the summarization process

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Budget Calculation Extensions

Budget calculation extensions enable you to control how Oracle Projects processes budgets and forecasts. You can use budget calculation extensions to facilitate budget and forecast entry by defining your own rules for calculating budget and forecast amounts, based on the quantities and raw cost amounts that you enter.

> **Note:** You can use function security to control whether users can override calculated amounts, based on user responsibility. The functions pertaining to this feature have names that begin with *Budget: Line Source*. See: Function Security in Oracle Projects, *Oracle Projects Implementation Guide*.

The extension is identified by the following items:

Item	Name
Body template	PAXBCECB.pls
Specification template	PAXBCECS.pls
Package	PA_Client_Extn_Budget

The names of the procedures are:

- calc_raw_cost
- calc_burdened_cost
- calc_revenue

Business Rules

You should determine the logic and the additional data elements your client extensions require before you write them. We recommend that you consider the following design issues for budget calculation extensions:

- What conditions should be true for a budget or forecast before it can be baselined?
- What are the conditions or circumstances under which you will derive the raw, burdened, or revenue amounts?
- How will you determine the rate to calculate the amount?
- How will you store the rates: in Oracle Projects tables or in custom tables?
- When can the derived amounts be overridden by the user?
- In what order should the calculations be executed if you have multiple rules?

You can use budget calculation extensions to calculate the following budget and forecast amounts:

Raw Cost

Oracle Projects calls the budget calculation extension for raw cost when you enter a *quantity* in a cost budget or forecast plan line. If you define rules in the budget calculation extension that return a value, then Oracle Projects displays the calculated amount in the *Raw Cost* amount field.

Examples of raw cost calculation rules that you can define

are:

- Calculate raw cost for an employee based on the number of hours entered
- Calculate raw cost for vehicle usage based on the number of days entered

Burdened Cost

Oracle Projects calls the budget calculation extension for burdened cost when you enter a *quantity* or a *raw cost* amount in a cost budget or forecast plan line. If you define rules in the budget calculation extension that return a value, then Oracle Projects displays the calculated amount in the *Burdened Cost* amount field.

Examples of burdened cost calculation rules that you can define are:

- Calculate raw cost andburdened cost for an employee based on the number of hours entered
- Calculate burdened cost for computer usage charges based on the raw costentered

Revenue

Oracle Projects calls the budget calculation extension for revenue when you enter a *quantity* in a revenue budget or forecast plan line. If you define rules in the budget calculation extension that return a value, then Oracle Projects displays the calculated amount in the *Revenue* amount field.

Examples of revenue calculation rules that you can define are:

- Calculate revenue for an employee based on a standard bill rate assigned to the task
- Calculate revenue for a job based on the number of hoursentered

Procedures

Following are descriptions of the procedures for this client extension.

You can view the parameters for these procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Calculate Raw Cost

The name for this procedure is *calc_raw_cost.*

Calculate Burdened Cost

The name for this procedure is *calc_burdened_cost.*

> **Tip:** Use the Cost Plus API to calculate the burdened cost amount using the burdened multipliers you have defined for the project or task. See: Cost Plus API, page 4-7.

Calculate Revenue

The name for this procedure is *calc_revenue.*

Additional Information About Parameters

Following is additional information about the parameters for this client extension.

Error Handling

Use the x_error_code, x_error_message, p_error_code, and p_error message parameters to help resolve error conditions should your procedure fail.

The x_err_code or p_error_code parameter indicates the processing status of your procedure as follows:

> **Tip:** Ensure that you are returning the status of the budget calculation procedure to the procedure that you are calling the budget calculation extension from to help resolve error conditions.

x_error_code = 0	The procedure executed successfully.
x_error_code < 0	An Oracle error occurred and the process did not complete.
x_error_code > 0	An application error occurred and the

process did
not complete

If x_error_code or p_error_code is set to a nonzero value in the client extension, a message such as the following is displayed:

Calculate raw cost budget client extension error <x_error_code>: <x_error_message>.

Related Topics

Designing Client Extensions, page 7-2

Budget Verification Extension

The budget verification extension enables you to define rules for validating a budget or forecast when it is submitted or baselined.

You should determine your requirements for submitting and baselining budgets and forecasts. For more information on submitting and baselining budgets and forecasts, see: Using Budgeting and Forecasting and Creating Budgets and Forecasts With Budgetary Controls and Budget Integration, *Oracle Project Management User Guide*.

The extension is identified by the following items:

Item	Name
Body template	PAXBCECB.pls
Specification template	PAXBCECS.pls
Package	PA_Client_Extn_Budget
Procedures	verify_budget_rules, stamp_client_extn_errors

You can view the parameters for these procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Verify Budget Rules

The procedure name is *veirfy_budget_rules*. You can use this procedure to build additional validations that Oracle Projects performs whenever a budget or forecast is submitted or baselined. The parameter *p_event* passes a value of either *SUBMIT* or

BASELINE to indicate the desired status of the budget or forecast being tested.

Stamp Client Extension Errors

The procedure name is *stamp_client_extn_errors*. The system uses it to display error messages when you upload a project workplan from an Excel spreadsheet. When you perform this action, the system calls both the Budget Calculation Extension and the Budget Verification extension.

For this procedure to work correctly, you must define lookup codes for all of the error messages that you would like to apply to an uploaded budget.

Related Topics

Designing Client Extensions, page 7-2

Budget Workflow Extension

The budget workflow extension enables you to customize the workflow processes for changing the status of a budget or forecast.

Oracle Projects calls the budget workflow process to determine whether to call Oracle Workflow to baseline a budget or forecast, and which workflow process to call.

The default budget workflow process calls the budget workflow extension to determine the budget or forecast approver.

The extension is identified by the following items:

Item	Name
Body template	PAWFBCEB.pls
Specification template	PAWFBCES.pls
Package	pa_client_extn_budget_wf

Before you implement this extension, you must define the rules that will determine whether to call Oracle Workflow to baseline a budget or forecast, and to select the budget or forecast approver.

You can view the parameters for the following procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Determine Whether to Call Workflow

The name of this procedure is *budget_wf_is_used.*

When Oracle Projects determines whether to call Oracle Workflow for a budget or forecast status change, it bases the decision on the settings of the budget type or plan type, and the project type. You can use this procedure to override those settings and to add additional requirements.

Start the Budget Workflow

The name of this procedure is *start_budget_wf.*

This procedure starts the workflow process for budget and forecast status changes. The procedure also contains the name of the workflow process that is called. The process indicated in the default procedure is PABUDWF.

Specify Budget Verification Rules

The name of this procedure is *verify_budget_rules.*

You can use this procedure to specify budget verification rules that are applied only when Oracle Workflow is used for budget and forecast status changes. This procedure is called by the procedure *pa_budget_wf.baseline_budget.*

Determine the Approver

The name of this procedure is *select_budget_approver.*

This procedure is called by Oracle Workflow to determine the budget or forecast approver. You can use this procedure to add rules for determining who can approve a budget or forecast. The default procedure returns the ID of the supervisor of the person who requested the budget or forecast status change.

Estimate to Complete Generation Method Extension

The Estimate to Complete Generation Method extension enables you to control the calculation of estimate to complete (ETC) quantities and amounts in forecasts.

You can use this extension to calculate quantities and amounts for raw cost, burdened cost, and revenue.

The following items identify the extension:

Item	Name
Body template	PAFPFGCB.pls
Specification template	PAFPFGCS.pls
Package	PA_FP_FCST_GEN_CLIENT_EXT

ETC Calculation Procedure

The name of this procedure is *fcst_gen_client_ext*.

Use this procedure to define calculations for ETC quantities and amounts for raw cost, burdened cost, and revenue.

Following is the PL/SQL table record type definition:

- type l_pds_rate_dtls_rec_type is RECORD

  (PERIOD_NAME pa_budget_lines.period_name%TYPE, RAW_COST_RATE pa_budget_lines.txn_standard_cost_rate%TYPE, BURDENED_COST_RATE pa_budget_lines.burden_cost_rate%TYPE, REVENUE_BILL_RATE pa_budget_lines.txn_standard_bill_rate%TYPE);

- type l_pds_rate_dtls_tab is

  TABLE 1 of l_pds_rate_dtls_rec_type;

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Control Item Document Numbering Extension

This extension enables you to create your own logic for numbering issues and change documents when automatic numbering is enabled for a control item type.

The extension is identified by the following items:

Item	Name
Body template	PACINRXB.pls
Specification template	PACINRXS.pls

Item	Name
Package	pa_ci_number_client_extn

Get Next Number

The name of the procedure is*get_next_number.*

Use this procedure to define your numbering logic. When automatic numbering is enabled for a control item type, Oracle Projects calls this procedure each time a number is assigned to an issue or a change document.

You can view the parameters for this procedure in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Related Topics

Implementing Client Extensions, page 7-2

Control Item Types, *Oracle Projects Implementation Guide*

Issue and Change Workflow Extension

This extension enables you to customize the workflow processes for submitting and approving issues and change documents.

The extension is identified by the following items:

Item	Name
Body template	PACIWFCB.pls
Specification template	PACIWFCS.pls
Package	pa_control_items_wf_client

You can view the parameters for the following procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Start Workflow

The name of this procedure is*start_workflow.* Use this procedure to start the workflow

process for issue and change document approval.

Set Control Item Approver

The name of this procedure is*set_ci_approver.* Use this procedure to specify persons that can approve issues and change documents.

Set Notification Party

The name of this procedure is *set_notification_party.* Use this procedure to specify persons to notify for approved and rejected issues and change documents.

Related Topics

Implementing Client Extensions, page 7-2

Contol Item Types, *Oracle Projects Implementation Guide*

Project Status Report Workflow Extension

The project status report workflow extension enables you to customize the workflow processes for approving and publishing a project status report.

You must determine how you want to approve and publish the report. See Overview of Project Status Reports, *Oracle Project Management User Guide*.

The default project status report workflow process calls the project status report workflow extension.

The extension is identified by the following items:

Item	Name
Body template	PAPRWFCB.pls
Specification template	PAPRWFCS.pls
Package	pa_report_workflow_client

You can view the parameters for the following procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

Start Workflow

The name of this procedure is *start_workflow***.** You can use this workflow to change or

add workflow parameters and to start the workflow.

Status Report Approver

The name of this procedure is *set_report_approver*. This procedure determines the approver for the project status report approval process. You can modify the procedure to add rules to determine who can approve a status report. The default procedure sends a notification to the approver that you specified for the report on the Status Report Setup Details page. If you did not specify an approver on this page, then the supervisor of the person who reported the report becomes the approver.

Notification Party

The name of this procedure is *set_report_notification_party*. This procedure determines which users receive workflow notifications when a project status report is approved, published, or rejected.

Related Topics

Designing Client Extensions, page 7-2

Custom Performance Measure Extension

This client extension enables you to create custom measures for reporting project performance.

The extension is identified by the following items:

Item	Name
Body template	PJISCO1B.pls
Specification template	PJISCO1S.pls
Package	PJI_PJP_SUM_CUST

You can view the procedure parameters in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The Custom Performance Measure client extension provides the following procedures:

Planning Custom Measure Procedure

The procedure name is PJP_CUSTOM_FPR_API.

Use this procedure to insert a maximum of 15 custom measures for financial and plan amounts into the columns labeled CUSTOM1- CUSTOM15 of the PJI_FP_CUST_PJPO table.

Project performance reporting summarization processes consider these new custom measures and inserts performance data lines against the measures in the PJI_FP_XBS_ACCUM_F table.

Activity Custom Measure Procedure

The procedure name is PJP_CUSTOM_ACR_API.

Use this procedure to insert a maximum of 15 custom measures for bookings and invoice amounts into the columns labeled CUSTOM1- CUSTOM15 of the PJI_FP_CUST_PJPO table.

Project performance reporting summarization processes consider these new custom measures and inserts performance data lines against the measures in the PJI_AC_XBS_ACCUM_F table.

Related Topics

Implementing Client Extensions, page 7-2

Project Performance Reporting, *Oracle Projects Implementation Guide*

Project Performance Status Extension

The Project Performance Status extension enables you to customize the logic involved in retrieving the overall performance status of the project. This extension is identified by the following items:

Item	Name
Body template	PAPESCLB.pls
Specification template	PAPESCLS.pls
Package	pa_perf_status_client_extn
Procedure	get_performance_status

Use the get_performance_status procedure to derive and retrieve the overall performance status for the project. You can write code to define the following relationships:

- the relationship between the severity and the numeric value given in the PREDEFINED_FLAG column of the PA_LOOKUPS view
- the relationship between the key performance area statuses and the overall performance status of the project

You can view the procedure parameters in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual. The required parameters for this procedure are listed below:

- P_OBJECT_TYPE
- P_OBJECT_ID
- P_KPA_SUMMARY

Related Topics

Implementing Client Extensions, page 7-2

Control Item Types, *Oracle Projects Implementation Guide*

Project Performance Tracking, *Oracle Projects Implementation Guide*

Project Status Inquiry (PSI) Extension

You can use a project status inquiry (PSI) client extension to derive an alternate column value, even if you have entered a column definition in the PSI Columns window. You can also use the extension to override the totals fields in the Project window.

To use a PSI client extension, you must:

- write the logic in a PL/SQL procedure and then store the procedure in the database
- define the column prompt for the column in the Project Status Inquiry Columns window

Running the PSI client extension will degrade the product's performance. Therefore, define your client extension procedures with as narrow a scope as possible.

The extension is identified by the following items:

Item	Name
Body template	PAXVPS2B.pls
Specification template	PAXVPS2S.pls

Item	Name
Package	pa_client_extn_status

You can view the parameters for the following procedures in the Oracle Integration Repository. The Oracle Integration Repository is described in the preface of this manual.

The PSI Get Columns Procedure

The Get Columns procedure consists of three functions, one for each status folder (project, task, and resource):

- ProjCustomExtn
- TaskCustomExtn
- RsrcCustomExtn

The name of the Get Columns procedure is *getcols*.

Each function has a parameter or "switch" that you can enable to run only that part of the client extension. You can run all, none, or any combination of the functions. By default, all three switches are disabled.

If you enable the Get Columns procedure, the Project Status window displays the column prompts defined in the PSI Columns window and the values calculated by the extension. Because the values calculated by the extension override values defined in the PSI Columns window, you do not need to enter a definition for a column whose value is calculated by a client extension.

> **Note:** If the procedure returns a NULL value, the Project Status window reads the value defined in the PSI Columns window.

The PSI Get Totals Procedure

The PSI Get Totals procedure consists of two functions for PSI Project window totals functionality:

- Hide_Totals
- Proj_Tot_Custom_Extn

By default, these functions are disabled. If the Get Columns procedure is enabled for the Project window, then one of these functions automatically disables the Project window Totals button, unless the extension is modified.

If you enable the PSI Totals client extension, you can override the totals fields for all thirty numeric columns on the Project window for which you assign values to the OUT NOCOPY-parameters. The Project window displays NULL for any OUT NOCOPY-parameter that is not assigned a value.

For added flexibility, the Totals query actually selects and summarizes columns from a user-defined view, PA_STATUS_PROJ_TOTALS_V. By default, this view maps directly to the base view queried by the PSI Project window. Providing you maintain the same column names and data types for the first 34 columns, you may change the select statement, substitute literals for columns, and add unions to PA_STATUS_PROJ_TOTALS_V.

The name of the Get Totals procedure is *Get_Totals*.

User-Defined Totals View

The following table lists the column names and data types that Oracle Projects provides for the user-defined totals view, PA_STATUS_PROJ_TOTALS_V.

> **Note:** While the first 34 column names and data types are required for the PSI Project window totals functionality, you may make modifications, such as changing the select statement or adding unions and new columns.

Column Name	Null	Type
PROJECT_ID	NOT NULL	NUMBER(15)
COLUMN1	NOT NULL	VARCHAR2(240)
COLUMN2	NOT NULL	VARCHAR2(240)
COLUMN3	NOT NULL	VARCHAR2(240)
COLUMN4 - COLUMN33	NOT NULL	NUMBER

The default select statement for PA_STATUS_PROJ_TOTALS_V is shown below:

```
CREATE or REPLACE FORCE VIEW PA_STATUS_PROJ_TOTALS_V
(PROJECT_ID,
COLUMN1,
COLUMN2,
COLUMN3,
COLUMN4...
)
AS SELECT
spg.project_id
spg.column1,
spg.column2,
spg.column3,
spg.column4...
FROM pa_status_proj_generic_v spg;
```

Related Topics

Project Summary Amounts, *Oracle Project Management User Guide*

Project Status Inquiry Burdening Commitments Extension

You can use the Project Status Inquiry Burdening Commitments client extension to control the display of burden cost amounts on commitments.

For a project type, you can choose burdening options that enable you to either store burden amounts on the same expenditure item with raw cost amounts or store burden amounts as separate expenditure items. This extension enables you to override the burdening options defined for projects types for purposes of displaying burden amounts for commitment transactions in Project Status Inquiry.

You can use the Burdening Commitments client extension to override the setup for display of burden costs on commitments.

The extension is identified by the following items:

Item	Name
Body template	PAXBSGCB.pls
Specification template	PAXBSGCS.pls
Package	pa_client_extn_burden_summary

The name of the function is *Same_Line_Burden_Cmt*.

This default value returned by the function is *False*. When the value is set to *False*, Oracle Projects displays burden amounts on commitments based on the burdening option you choose for displaying burden amounts for a project type.

If you specify a value of *True*, Oracle Projects always displays burden amounts for

commitment transactions on the same expenditure item with raw cost amounts, regardless of the burdening option you choose for a project type.

Related Topics

(All Project Types) Costing Information, *Oracle Projects Implementation Guide*

Drilling Down to Actuals, Commitments, and Events Detail, *Oracle Project Management User Guide*

Storing, Accounting, and Viewing Burden Costs, *Oracle Project Costing User Guide*

Project Status Inquiry Commitment Changes Extension

When you run the PRC: Update Project Summary Amounts process, Oracle Projects checks commitments for each project to see if changes have occurred. If any of these changes have occurred, the commitment summary amounts are deleted and recreated.

> **Important:** If you have modified the Oracle Projects commitments view, PA_COMMITMENT_TXNS_V, you must also modify the Commitment Changes client extension to test for changes in commitments.

The extension is identified by the following items:

Item	Name
Body template	PACECMTB.pls
Specification template	PACECMTS.pls
Package	pa_client_extn_check_cmt
Procedure	commitments_changed

> **Important:** Do not change the name of the extension procedures or parameters. Also, do not change the parameter types or parameter order in your procedure. After you write a procedure, compile it and store it in the database. For more information, see: Writing PL/SQL Procedures, page 7-4.

The name of the procedure is commitments_changed.

The body template includes a sample procedure that contains the default coding for the commitments_changed function. By default, the procedure checks for the following

changes in the system-defined commitments view:

- new commitments have been added
- a commitment has been fully or partially converted to cost (for example, a purchase order has been matched by a supplier invoice.)
- the status of a commitment has changed from Unapproved to Approved

If the commitments have changed, then the function returns a value of Y. Otherwise, it returns the value N. If Y is returned, then the summarization process rebuilds the commitment summarization amounts.

If you have modified the commitments view, you must modify this procedure so that it can determine whether the user-defined commitments have changed since the last summarization process.

The sample procedure includes the following assumptions:

- The user commitment view is PA_COMMITMENTS_OUTSIDE_SYSTEM
- The line type is *I*
- The transaction source is OUTSIDE_SYSTEM
- The column CMT_HEADER_ID stores the header ID from the user view
- The column CMT_LINE_NUMBER stores the line number from the user view
- The APPROVED_FLAG is checked for a change since the last summarization process

The sample procedure checks for the following conditions:

- commitments in PA_COMMITMENT_TXNS with a different status (the APPROVED_FLAG column) from the same commitment in the User view
- commitments in the user view that do not exist in PA_COMMITMENT_TXNS

You must determine which column or columns in your commitments view to check for a change in value, and identify the procedure to check for new commitments.

Part 4

ORACLE PROJECTS OPEN INTERFACES

13

Oracle Projects Open Interfaces

This chapter describes the open interfaces in the Oracle Projects applications.

This chapter covers the following topics:

- Transaction Import
- Transaction Import Interface

Transaction Import

Oracle Projects provides a single open interface, called Transaction Import. Transaction Import enables you to load transactions from external cost collection systems into Oracle Projects. Transaction Import creates pre-approved expenditure items from transaction data entered in external cost collection systems. Examples of external cost collection systems are:

- Timecard entry systems
- Expense report entry systems
- Supplier invoice entry systems, such as Oracle Payables
- Electronic data collection systems for asset usage (computer, printer, phone, etc.)
- Payroll systems that calculate complex transactions for benefits, overtime, and other labor charges
- Fixed assets systems that calculate depreciation charged to a project
- Manufacturing systems, such as Inventory and Work in Process

When loading transactions, Transaction Import creates expenditure batches, expenditures, and expenditure items. You can import costed or uncosted, accounted or unaccounted, and adjusted transactions into Oracle Projects.

You can use Transaction Import to import transactions that originate in any currency. The original currency and amount of each transaction is stored if the transaction currency is different from the project and/or functional currency.

This section describes how Transaction Import works. It also discusses how Transaction Import groups transactions to create expenditure batches. We also include information about the types of transactions you can load from external systems. Finally, we discuss how to view, process, and adjust the imported transactions in Oracle Projects.

Related Topics

Transaction Import Interface, page 13-25

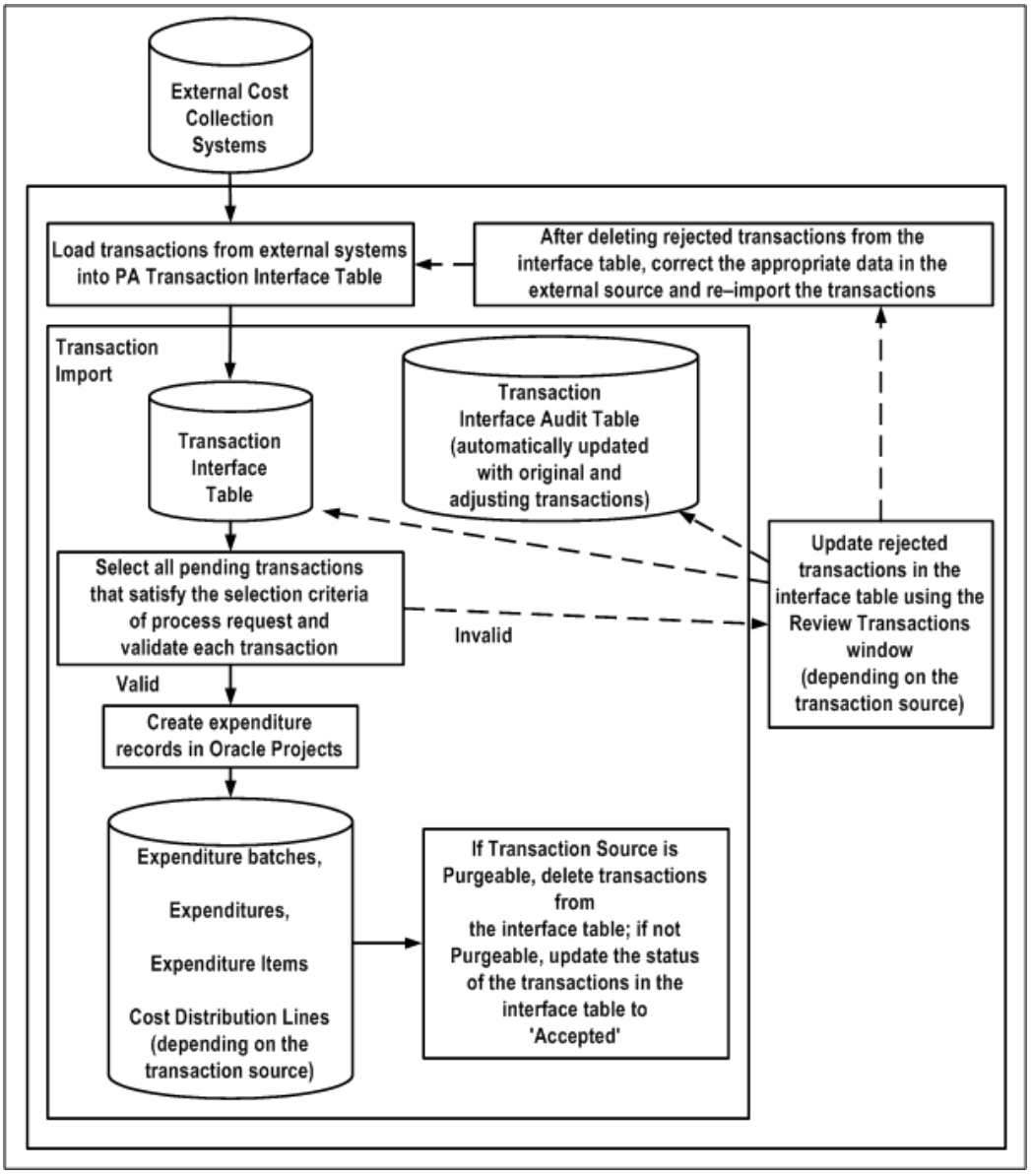
Expenditure Item Validation, *Oracle Project Costing User Guide*

Integrating with Oracle Project Manufacturing, *Oracle Projects Fundamentals*

Transaction Import Process Diagram

The following illustration shows the flow of the transaction import process.

Transaction Import Process



The Transaction Import process flow includes the following steps:

1. Load transactions from external cost collection systems into the PA Transaction Interface Table.

2. Select all pending transactions that satisfy the selection criteria of the process report and validate each transaction.

3. If there are invalid transactions, then the process flow includes the following steps:

1. Update rejected transactions in the interface table using the Review Transactions window (depending on the transaction source). These records appear in the PA Transaction Interface Audit Table (automatically updated with original and adjusting transactions) and the PA Transaction Interface Table.

2. After deleting rejected transactions from the interface table, fix the appropriate data in the external source and re-import the transactions.

3. Return to Step 1.

4. If all transactions are valid, then create expenditure records in Oracle Projects.

5. If the transaction source is purgeable, then delete transactions from the interface table. If not, then update the status of the transactions in the interface table to Accepted.

Using Transaction Import

When you import transaction information from external cost collection systems, Oracle Projects records the transaction details and the source of the imported transactions during transaction import. The PRC: Transaction Import process (also referred to as Transaction Import) validates the transaction information, reports any exceptions, and creates transactions for all of the valid transactions. Oracle Projects does not import a transaction more than once.

Populating the Interface Table

Transaction Import uses transaction data from your external system to create corresponding transactions in Oracle Projects.

Before you submit the PRC: Transaction Import process, you must populate the Transaction Interface table (PA_TRANSACTION_ INTERFACE_ALL) with records that you want to import.

To populate the table, you must write a custom feeder program to convert data into a standard data format that Transaction Import can read. Transaction Import can then convert your imported data into transactions in Oracle Projects.

Writing a Feeder Program

The type of environment from which you want to interface your data determines the type of feeder program you need to write. For example, you can use SQL*Loader, PL/SQL, or Pro*C to write a feeder program to interface transaction data from a non-Oracle system. Or, you can write a conversion program to interface historical data from your previous cost collection system.

Ensure that your transaction flat file has the appropriate information to populate

PA_TRANSACTION_INTERFACE_ALL as indicated in the PA_TRANSACTION_INTERFACE_ALL Table Description. If a value is not required for a column, you may leave the column empty. See: PA_TRANSACTION_INTERFACE_ALL Table Description, page 13-27

Selecting an Import Utility

SQL*Loader is a powerful and easy-to-use tool that should be able to accommodate all of your import needs. However, depending on the complexity of your import program, you may also want to use Oracle's Pro* language products such as Pro*C, Pro*Cobol and Pro*Fortran to write the program.

Your import utility file must populate PA_TRANSACTION_ INTERFACE_ALL as indicated in the previous table description. Also, you should code your file to populate the TRANSACTION_ SOURCE column in PA_TRANSACTION_INTERFACE_ALL with the Transaction Source code exactly as you defined it in the Transaction Sources window.

You must provide any information that the interface table requires that your external system does not provide. For example, if your external timecard system does not provide expenditure types, you must create at least one expenditure type and specify it in your control file.

Uploading Expenditure Batches from Microsoft Excel

You can enter and upload pre-approved expenditure batches using Microsoft Excel spreadsheets. The upload process populates the transaction import table. You can optionally use the upload parameter to run the transaction import process automatically.

For additional information, see: Uploading Expenditure Batches from Microsoft Excel, *Oracle Project Costing User Guide*.

Transaction Sources

When you submit Transaction Import, you must identify the source of the transactions that you want to import. The source can be any transaction source defined during implementation. You can also use transaction sources predefined by Oracle Projects.

The list of values for the transaction source parameter displays all of the transaction sources in the PA_TRANSACTION_SOURCES table. Any transaction source that has pending records in the Transaction Interface table are marked with an asterisk in the list of values.

> **Important:** Do not use predefined transaction sources for supplier costs and expense reports, Oracle Labor Distribution, project allocations, and capitalized interest transactions when you run the PRC: Transaction Import program. For additional information about predefined transaction sources, see: Transaction Sources, *Oracle Projects*

Implementation Guide.

Defining Transaction Sources

You define the source of transactions for Transaction Import in the Transaction Sources window. You can define an unlimited number of transaction sources. For each transaction source, you specify options that control how transactions are processed.

Use your import utility to enter this transaction source in the TRANSACTION_SOURCE column of the PA_TRANSACTION_ INTERFACE_ALL table. You then select the name in the Submit Request window when you want to import transactions from this source. See: Transaction Sources, *Oracle Projects Implementation Guide*.

Importing Transactions

After you populate the interface table, complete the following steps to import external transactions into Oracle Projects:

You use the Submit Request window to run Transaction Import.

To import transaction data into Oracle Projects:

1. In the Navigator window choose Expenditures > Transaction Import > Import Transactions. Oracle Projects opens the Submit Request window and enters the PRC: Transaction Import request name.

   Alternately, you can navigate to the Submit Requests window and submit the PRC: Transaction Import process.

2. Choose the Transaction Source you want to process. (This field is required.)

3. Optionally identify a specific batch within the transaction source to process.

4. Choose Submit.

Correcting and Resubmitting Transactions

Use the Review Transactions window to review and resubmit rejected transactions or to create and submit new transactions. See: Resolving Import Exceptions, page 13-53

Output Reports

Transaction Import has two output reports:

- an exception report, which lists all rejected transactions
- a summary report of successfully imported transactions

Related Topics

Submitting Requests, *Oracle Projects Fundamentals*

Transaction Import Interface, page 13-25

Transaction Import Report, *Oracle Projects Fundamentals*

Types of Items That You Can Import

Using Transaction Import, you can import transactions with various expenditure type classes, as listed below.

- Straight Time
- Overtime
- Expense Reports
- Usages
- Inventory
- Work in Process
- Miscellaneous
- Supplier Invoices

You can import the transactions listed above from any transaction source associated with any expenditure type class.

Labor and Expense Report Transactions

When Project Resource Management is installed the import process associates labor and expense report transactions to scheduled work assignments as follows:

If assignment information is provided by the external system, then that information is validated and imported as part of the transaction.

If assignment information is not provided by the external system, then assignments are associated as follows:

- If the resource for the transaction has only one available assignment, then the assignment is selected.
- If the resource for the transaction has multiple available assignments, then the assignment with the earliest start date is selected.
- If the resrouce for the transaction has no available assignments, then the transaction

is imported as unscheduled.

> **Note:** You can override the association logic for resources with multiple available assignments using the transaction controls client extension. For information on transaction controls client extensions, see., page 8-10

Assignments are considered available when the following conditions are met:

- The assignment resource equals the expenditure item resource.
- The assignment dates include the expenditure item date.
- The assignment status allows actual transactions.
- The schedule including the assignment is confirmed.

Unmatched Negative Transactions

You can import unmatched negative transactions. These transactions have a negative quantity and cost and do not reverse another transaction. Unmatched negative transactions are generally used for summary-level adjustments or to correct converted transactions.

Oracle Projects does not verify that an original transaction exists for unmatched negative transactions.

Related Topics

Expenditure Type Classes, *Oracle Projects Implementation Guide*

Transaction Sources, *Oracle Projects Implementation Guide*

Loading Items as Costed or Uncosted

You can load uncosted items and costed items. The transaction source associated with the transaction specifies whether a transaction is costed or uncosted. If the Import Raw Cost Amounts option is selected for a transaction source, it indicates that the transactions have already been costed.

Uncosted Items Items for which only the quantity is provided. Oracle Projects costs these transactions like other transactions based on the cost multiplier and quantity.

Costed Items Items for which the quantity and transaction currency raw cost are provided. Oracle Projects does not recalculate the transaction currency raw cost of imported costed items.

With Oracle Projects, you can perform burdening and accounting on costed and

uncosted items that you load via Transaction Import.

Loading Items as Accounted or Unaccounted

Each transaction source specifies whether items have already been accounted in the external system, by the external system. Identifying items as accounted or unaccounted affects how Transaction Import processes the items. If the Raw Cost GL Accounted option is selected for a transaction source, it indicates that the transactions are accounted.

> **Note:** You can load items with the expenditure type classes of *Expense Reports* and *Supplier Invoice* only as *Accounted*.

Unaccounted Items

Items for which the appropriate GL account has not been determined. When loading unaccounted items, the Transaction Import process calls any transaction control extensions that you have defined. Cost calculation processes (distribute raw and burden costs) determine the cost amount (for uncosted items only) and the GL account to which the cost should be posted.

Accounted Items

Items for which the external systems have already determined the ledger currency raw cost amounts and posted the GL accounts to Oracle General Ledger or Oracle Subledger Accounting. Processes within Oracle Projects do not generate accounting events for these items to send the accounting information to Oracle Subledger Accounting. As a result, Oracle Subledger Accounting does not create accounting for these items. When loading accounted items, Transaction Import creates cost distribution lines with a status of Received. Transaction Import also creates expenditure items and expenditures that are identified as accounted. If you import accounted items, you must provide the debit and credit code combination ID. When loading accounted transactions, Transaction Import will not call any extensions, create related items, or allow you to import related items.

> **Important:** If you import items with both the *GL Accounted* and *Allow Adjustments* options enabled, you can adjust the expenditure items in Oracle Projects. You need to reconcile costs both between Oracle Projects and the external system,

and between Oracle General Ledger and another general ledger application. You may also need to reconcile costs between the external system and Oracle Subledger Accounting.

Loading Burden Transactions

You can import burden costs using the Transaction Import process. Depending on the definition of the transaction source, you can control how burden costs are imported and accounted. You can import the burdened costs as either a value on the expenditure item or as separate burden transaction expenditure items. Alternatively, you may choose not to import burden costs and allow Oracle Projects to calculate and store the burden costs as you have defined them in Oracle Projects.

Burden transactions have raw costs and quantities of zero and only burden amounts associated with the transactions. You identify burden transactions by assigning them an expenditure type class of Burden Transaction.

There is no predefined transaction source for burden transactions. You can create a new transaction source with a default expenditure type class of Burden Transaction and then use this transaction source to import burden transactions.

Controlling Import of Burden Transactions

Like the expenditure entry programs, Transaction Import allows burden transactions to be charged to projects that are not set up for burdening -- that is, projects on which the associated project type costing information does not have the Burdened option enabled.

You can use Transaction Controls to prevent users from entering or importing burden transactions on a project.

Loading Project Manufacturing Costs

Oracle Projects predefines the transaction sources shown in the following table to enable you to import manufacturing resource costs from Oracle Manufacturing for the Oracle Project Manufacturing integration:

Transaction Source	Default Expenditure Type Class
Inventory	Inventory
Inventory Misc	Inventory

Transaction Source	Default Expenditure Type Class
Inventory with Accounts	Inventory
Inventory with No Accounts	Inventory
Work in Process	Work in Process
WIP with Accounts	Work in Process
WIP with No Accounts	Work in Process
WIP Straight Time with Accounts	Straight Time
WIP Straight Time with No Accounts	Straight Time

> **Note:** When a transaction source indicates *with No Accounts*, Oracle Projects derives accounts for imported transactions using AutoAccounting, generates accounting events, and creates accounting in Oracle Subledger Accounting. For all other transaction sources listed in the preceding table, Oracle Manufacturing derives accounts and creates accounting in Oracle Subledger Accounting, and Oracle Projects imports the accounts. For more information about transaction sources, see: Transaction Sources, *Oracle Projects Implementation Guide*.

If you want to import manufacturing transactions from a non-Oracle manufacturing application, you must define your own transaction source.

Any transaction characterized by one of the transaction source and default expenditure type class combinations represented in the table above constitutes a manufacturing cost. However, you can use these transaction sources with other expenditure type classes. Note the following issues regarding Oracle Project Manufacturing transactions:

- Because they are transferred to Oracle Projects by sub-element (which maps to the expenditure type), multiple manufacturing transactions associated with one of the predefined the transaction sources can use the same original system reference.

- You can only adjust manufacturing transactions with a transaction source Inventory Misc. in Oracle Projects. You cannot adjust any other manufacturing costs in Oracle Projects, because all accounting for the costs is performed in Oracle Manufacturing. Any adjustments to these costs must originate in Oracle Manufacturing.

Related Topics

Integrating with Oracle Project Manufacturing, *Oracle Projects Fundamentals*

Loading Foreign Currency Transactions

Transaction Import enables you to import transactions that originate in any currency. This section describes how Transaction Import handles foreign currencies.

Currency Conversion Attributes for Imported Transactions

When transactions are imported that originated in a currency different from the functional currency or project currency, Oracle Projects must convert the transaction amount to those currencies.

To convert foreign currency transactions to the functional and project currencies, Oracle Projects must first determine the exchange rate type and exchange rate date.

To determine conversion attributes for foreign currency transactions imported by Transaction Import, Projects uses the logic shown below.

Each of the attributes is determined separately. That is, if a rate type is found in step one, but no rate date is found at that level, the rate type is used and the logic is followed to the next level to determine the rate date.

Case 1: Functional Currency Equals Project Currency

If the functional currency of the operating unit that incurred the cost (the expenditure operating unit) is equal to the functional currency of the operating unit that owns the project to which the cost is charged (the project operating unit), the following logic is used to determine the currency conversion attributes used in converting the transaction amounts from the transaction currency:

First, the functional currency attributes are determined as follows:

1. If a user-entered conversion attribute is included in the transaction, that attribute is used for the conversion.

2. If a user-entered attribute is not included in the transaction, the system looks for a default attribute for the task to which the transaction is charged.

3. If default conversion attribute does not exist for task, the system uses the default conversion attribute for the project to which the transaction is charged.

4. If there are no defaults entered at the project or task level, the default attribute is the attribute entered in the implementation options for the expenditure operating unit.

   Note: For the Expense Report expenditure type, the conversion attributes entered in the implementation options are always used.

These attributes are used to obtain a conversion rate, which is used to convert the transaction currency amount to the functional currency. Because the functional currency is equal to the project currency, the project currency amount is equal to the functional currency amount.

This logic is illustrated in the following table:

Functional Currency Rate Type and Rate Date	Project Currency Rate Type and Rate Date
The following hierarchy is used: 1. User-entered value 2. Default value from the lowest task 3. Default value from the project 4. Default value from the expenditure operating unit's implementation options	The functional currency attributes are used.

Case 2: Functional Currency Does Not Equal Project Currency

If the functional currency for the transaction is not equal to the project currency, the following logic is used to determine the currency conversion attributes:

The functional currency attributes are determined as follows:

1. If a user-entered conversion attribute is included in the transaction, that attribute is used for the conversion.

2. If a user-entered attribute is not included in the transaction, the system uses the default attribute in the implementation options for the expenditure operating unit.

The attributes are used to obtain a conversion rate, which is used to convert the transaction currency amount to the functional currency.

The project currency attributes are determined as follows:

1. If user-entered conversion attribute is included in the transaction, that attribute is used for the conversion.

2. If user-entered attribute is not included in the transaction, the system looks for a default attribute for the task to which the transaction is charged.

3. If default conversion attribute does not exist for task, the system uses the default conversion attribute for the project to which the transaction is charged.

4. If there are no defaults entered at the project or task level, the default attribute is the attribute entered in the implementation options.

- The default rate date is the implementation option for the expenditure operating unit.
- The default rate type is the implementation option for the project operating unit.

The attributes are used to obtain a conversion rate, which is used to convert the transaction currency amount to the project currency.

This logic is illustrated in the following table:

Functional Currency Rate Type and Rate Date	Project Currency Rate Type and Rate Date
The following hierarchy is used: 1. User-entered value 2. Default value from the expenditure operating unit's implementation options	The following hierarchy is used: 1. User-entered value 2. Default value from the lowest task 3. Default value from the project 4. For the rate type, the default value from the project operating unit's implementation options. For the rate date, the default value from the expenditure operating unit's implementation options.

Rounding Limit for Accounted Multi-Currency Transactions

When a transaction is imported as accounted, you must supply a value for ACCT_RAW_COST (functional raw cost). If the transaction currency is different from the functional currency, you must also supply the functional conversion attributes.

Transaction Import recalculates the functional raw cost, using the functional currency attributes you provide, to ensure that the imported functional raw cost and functional currency attributes are in agreement. The rounding limit (ACCT_EXCHANGE_ROUNDING_LIMIT) is used as a tolerance level when comparing the calculated and supplied figures.

If the difference between these two amounts is less than or equal to the tolerance limit, then Transaction Import accepts the transaction. Otherwise, the Transaction Import rejects the transaction.

Examples of this calculation are shown in the following table:

Column or Calculation	Example 1: Values Within Rounding Limit (transaction is accepted)	Example 2: Values Outside the Rounding Limit (transaction is rejected)
Transaction raw cost (DENOM_RAW_COST)	80 GBP	80 GBP
Functional raw cost (ACCT_RAW_COST)	100 USD	85 USD
Functional Exchange Rate (based on supplied currency attributes)	1.2375	1.2375
Rounding Limit (ACCT_EXCHANGE_ROUNDING_ LIMIT)	10	10
Calculated functional raw cost (DENOM_RAW_COST * Functional Exchange Rate)	99 USD	99 USD
Difference between calculated and supplied functional raw cost	abs (100 - 99) = 1	abs (85 - 99) = 14

In Example 1, the calculated functional raw cost (99 USD) differs from the supplied functional raw cost (100 USD) by 1, which is less than the tolerance limit (10). Therefore, the transaction is accepted.

In Example 2, the values are the same as in Example 1, except that the supplied functional raw cost is 85 USD. This amount differs from the calculated functional raw cost (99 USD) by 14, which is more than the tolerance limit (10). Therefore, the transaction is rejected.

> **Note:** If the supplied ACCT_ROUND_LIMIT value is null, the rounding limit is zero.

Import Options (Transaction Source)

Transaction Import processes transactions based on the transaction source you select for each imported transaction. When you set up each transaction source, you select options that determine how transactions are processed by Transaction Import.

Following are some of the fields and actions you can control when you choose

transaction source options:

- the default expenditure type class
- whether Oracle Projects calculates raw cost amounts
- whether Oracle Projects calculates burden amounts
- whether Oracle Projects interfaces amounts to Oracle Payables
- whether Oracle Projects imports the expenditure organization for employee transactions
- whether to allow interface modifications before transaction import
- whether duplicate reference IDs are allowed within a transaction source
- whether the transaction can be reversed or adjusted after it is imported
- whether Oracle Projects generates accounting events to create accounting in Oracle Subledger Accounting.

For a detailed description of all transaction source options, see: Transaction Sources, *Oracle Projects Implementation Guide*.

Grouping Transactions into Expenditure Batches and Expenditures

This section describes how Transaction Import groups transactions into expenditure batches and expenditures.

When you load transactions into the interface table from an external system, Oracle Projects requires that you specify the following information for each transaction:

- Transaction source
- Batch name
- Expenditure ending date
- Employee name or Organization
- Expenditure type class (if this information is not provided for the transaction, the value defaults to the expenditure type class assigned to the transaction source during implementation)
- The following currency attributes, if foreign currencies are used:
  - transaction currency

- functional currency conversion rate date
- functional currency conversion rate type
- functional currency conversion rate

Transaction Import groups all of the transactions processed during an interface run into expenditures and expenditure batches in the following manner.

> **Important:** If the employee number is specified, Transaction Import ignores any value for the organization and derives the organization value based on the employee's assignment.
>
> An exception to this is if the Import Employee Organization option is selected for the transaction source.

Straight Time, Overtime, and Expense Reports

If the transaction source of the transactions being processed is defined with an expenditure type class of *Straight Time*, *Overtime*, or *Expense Reports*, the transactions are grouped into expenditures and expenditure batches based on the following information:

- Transaction source
- Expenditure type class
- Batch name
- Employee number
- Expenditure ending date
- Expenditure Organization: This information is used if the ALLOW_EMP_ORG_OVERRIDE flag in the transaction sources table is set to "Y"
- Additional grouping criteria, provided by the user, using the following columns:
  - ORIG_EXP_TXN_REFERENCE1
  - USER_ORIG_EXP_TXN_REFERENCE
  - VENDOR_NUMBER
  - ORIG_EXP_TXN_REFERENCE2
  - ORIG_EXP_TXN_REFERENCE3

- The following currency attributes, if applicable:
  - transaction currency
  - functional currency conversion rate date
  - functional currency conversion rate type
  - functional currency conversion rate

Each unique batch name becomes an expenditure batch, and each unique expenditure type class, employee number, and expenditure ending date combination becomes an expenditure within the expenditure batch. The ending date of the expenditure batch is set to the maximum ending date of all the expenditures created within that batch.

An employee number is required for all transactions with an expenditure type class Straight Time, Overtime, or Expense Reports. Transactions with any other expenditure type classes do not require an employee number.

All Other Expenditure Type Classes

If the transaction source of the transactions being processed is defined with an expenditure type class of *Usages*, *Miscellaneous Transactions*, *Burden Transactions*, *Inventory*, or *Work in Process*, the key information in the interface table used in grouping transactions into expenditures and expenditure batches is as follows:

- Transaction source
- Expenditure type class
- Batch name
- Employee number (optional)
- Expenditure organization name
- Expenditure ending date
- Additional grouping criteria, provide by the user, using the following columns:
  - ORIG_EXP_TXN_REFERENCE1
  - USER_ORIG_EXP_TXN_REFERENCE
  - VENDOR_NUMBER
  - ORIG_EXP_TXN_REFERENCE2
  - ORIG_EXP_TXN_REFERENCE3

- The following currency attributes, if applicable:
  - transaction currency
  - functional currency conversion rate date
  - functional currency conversion rate type
  - functional currency conversion rate

Each unique batch name becomes an expenditure batch, and each unique expenditure type class, employee number, organization, and expenditure ending date combination becomes an expenditure within the expenditure batch. The ending date of the expenditure batch is set to the maximum ending date of all the expenditures created within that batch.

Related Topics

Transaction Import Example: Labor and Expense by Employee Number, page 13-19

Transaction Import Example: Usage, page 13-21

Transaction Import Example: Labor and Expense by Employee Number

In this example, all imported expenditures are in the functional currency. Therefore, currency attributes are ignored in grouping expenditure items.

You load the following transactions (expenditure items) into the interface table. The transaction source of Site1 has expenditure type classes of Straight Time and Expense Reports.

Trx Number	Trx Source	Expenditure Type Class	Batch Name	Employee Number	Expenditure Ending Date
1	Site1	Straight Time	L1	1000	02-OCT-95
2	Site1	Straight Time	L1	1000	25-SEP-95
3	Site1	Expense Reports	L1	1000	25-SEP-95
4	Site1	Expense Reports	L1	1001	09-OCT-95
5	Site1	Straight Time	L2	1001	09-OCT-95

Trx Number	Trx Source	Expenditure Type Class	Batch Name	Employee Number	Expenditure Ending Date
6	Site1	Straight Time	L2	1001	09-OCT-95

If you submit Transaction Import for the transaction source *Site1* and do not specify a specific batch to process (pick all transactions with transaction source Site1), then Transaction Import will process all six of the above transactions.

Assuming that all of the transactions in this example are valid, then Oracle Projects creates two expenditure batches, L1 and L2.

Batch L1 is shown in the following table:

Transaction Number	Expenditure Type Class	Employee Number	Expenditure Ending Date
1	Straight Time	1000	02-OCT-95
2	Straight Time	1000	25-SEP-95
3	Expense Reports	1000	25-SEP-95
4	Expense Reports	1001	09-OCT-95

Batch L2 is shown in the following table:

Transaction Number	Expenditure Type Class	Employee Number	Expenditure Ending Date
5	Straight Time	1001	09-OCT-95
6	Straight Time	1001	09-OCT-95

Because the transaction source has expenditure type classes *Straight Time* and *Expense Reports*, Transaction Import groups the transactions by employee, expenditure ending date, and expenditure type class when creating expenditures.

The resulting expenditures for batch L1 are shown in the following table:

Transaction Number	Expenditure Type Class	Employee Number	Expenditure Ending Date
1	Straight Time	1000	02-OCT-95
2	Straight Time	1000	25-SEP-95
3	Expense Reports	1000	25-SEP-95
4	Expense Reports	1001	09-OCT-95

The resulting expenditures for batch L2 are shown in the following table:

Transaction Number	Expenditure Type Class	Employee Number	Expenditure Ending Date
5,6	Straight Time	1001	09-OCT-95

> **Note:** Although transactions 2 and 3 were for the same employee and the same ending date, Oracle Projects created two expenditures. Transactions with different expenditure type classes are imported into different expenditure batches. Different batch names will also result in the creation of different expenditure batches, even if they contain transactions for the same employee and ending date.

Because the ending date of the expenditure batch created is equal to the maximum ending date of the expenditures created within that batch, the batch ending dates for our example are as follows:

Batch Name	Expenditure Ending Date
L1	09-OCT-95
L2	09-OCT-95

Transaction Import Example: Usage

In this example, all imported expenditures are in the functional currency. Therefore, currency attributes are ignored in grouping expenditure items.

You load the following transactions into the interface table; the transaction source Usage has an expenditure type class of Usages. The grouping logic is slightly different for usage items, because usage expenditures can be created for an employee or an organization.

In the example shown in the following table, all transactions have the transaction source *Usage* and expenditure type class Usages. The batch name is *U1* and the expenditure ending date is 02-OCT-95.

> **Note:** You do not need to enter an employee number for usage transactions.

Transaction Number	Employee Number	Organization
1	1000	West
2	1000	East
3		West
4		Midwest

Because all of these transactions have the same batch name, Oracle Projects creates only one expenditure batch, U1. For usage items, Transaction Import groups transactions by employee, organization, and expenditure ending date when creating expenditures. The resulting expenditures after import are shown in the following table:

Trx Number	Expenditure Type Class	Employee Number	Organization	Expenditure Ending Date
1, 2	Usages	1000	*Employee Org*	02-OCT-95
3	Usages		West	02-OCT-95
4	Usages		Midwest	02-OCT-95

Notice that transactions (1) and (2) appear in the same expenditure because they were for the same employee/expenditure ending date, even though the organization name specified for both is different. If a transaction specifies an employee number, Transaction Import ignores any value for Organization and derives the organization value based on the employee's assignment (if the Import Employee Organization option is not used).

Also note that even if employee 1000's organization assignment were West, the resulting expenditures would still be the same. Transaction Import never groups usage transactions for an employee into the same expenditure as usage transactions for an organization.

Viewing and Processing Imported Transactions

You can view and process imported transactions in various ways.

Viewing Transactions in Oracle Projects

Transaction Import loads transactions as pre-approved expenditure items. Expenditure batches are created with a status of Released. A status of Released indicates that the expenditure batch is fully approved and ready for cost distribution.

> **Note:** All transactions that have already been accounted for in external systems, including manufacturing transactions, are loaded as costed transactions. These transactions are created with cost distribution lines and a status of Received.

You can view imported expenditure batches and associated expenditures and expenditure items using the Expenditure Inquiry and Expenditure Batches windows in Oracle Projects.

Expenditure Batch Names

The expenditure batch name within Oracle Projects is created as a concatenation of the batch name and expenditure type class entered in the transaction interface table and the interface ID. For example, an expenditure batch name may appear as follows: B1ST101.

B1 is the batch name loaded from the external system. ST is the expenditure type class ('ST' for Straight Time). 101 is the interface ID generated when you run Transaction Import.

The maximum length of the expenditure batch name is 20 characters (10 for the batch name, 3 for the expenditure type class, and 7 for the interface ID). The interface ID is an Oracle sequence that resets to 1 after 9999999. If a duplicate expenditure batch name results from resetting the interface ID to 1, change the batch name of the entire batch.

Viewing Transactions in the Audit Report

To see detailed information on successfully imported expenditure items, use the following information as parameters for the AUD: Pre-Approved Expenditure Entry Audit Report. The information for these parameters is displayed in the Transaction Import output report.

- Expenditure batch

- Employee name that corresponds to the user ID of the person who submitted Transaction Import

Identifying the "Entered By" User for Reporting Purposes

For viewing imported transaction online, or for using the Entered By parameters in reports such as the Pre-Approved Expenditures Entry Audit Report, use the employee name that corresponds to the user ID of the person who submitted the process as the entered by person.

> **Tip:** You may want to create a new user to run Transaction Import with a unique name, such as TRX IMPORT USER, so you can easily identify and report imported transactions.

Adjusting Imported Transactions in Oracle Projects

You can adjust imported transactions in Oracle Projects, if the transaction source allows this type of change. See: Expenditure Adjustments, *Oracle Project Costing User Guide* and Transaction Sources, *Oracle Projects Implementation Guide*.

> **Note:** Raw cost values for transactions that were already costed when loaded into Oracle Projects will not be changed if you mark the item for cost recalculation.

Uniquely Identifying Transactions

You can uniquely identify imported transactions by the transaction source and the original transaction reference, if you do not allow duplicate system references for the transaction source. You can review this information in the Expenditure Items window, which you can access from the Expenditure Inquiry window.

Processing Imported Transactions

Oracle Projects processes imported transactions just as it processes transactions entered using the expenditure entry forms. The imported transactions that are not accounted (as specified for the transaction source) are processed in the appropriate cost distribution program. If expenditure items are billable and charged to a contract project, they are also processed during revenue and invoice generation. Accounting transactions are then interfaced to other Oracle Applications.

Purging Imported Transactions

You can purge imported transactions from the interface table either automatically or manually:

- To purge imported transactions automatically, you specify that a particular

transaction source is purgeable.

- To purge imported transactions manually, use SQL*Plus to remove the records from the interface table.

Transaction Import Interface

This section includes a detailed description of the Transaction Import interface table, PA_TRANSACTION_INTERFACE_ALL. It also describes the validation Oracle Projects performs for imported transactions. This section also describes how to resolve import exceptions.

Related Topics

Transaction Import Validation, page 13-25

The Transaction Import Interface Table, page 13-27

Populating the Interface Table, page 13-4

Importing Transactions, page 13-6

Resolving Import Exceptions, page 13-53

Transaction Import Validation

You use an import utility to load transaction information into the interface table (PA_TRANSACTION_INTERFACE_ALL) for each transaction you want to create. You can load the table directly from your external system, or you can fill in some values using SQL*Plus.

Transaction Import validates your data for compatibility with Oracle Projects by ensuring that the columns in the interface table reference the appropriate and active values and columns in Oracle Projects.

Validating Expenditure Items

Transaction Import validates all items within an expenditure before it creates an expenditure. If at least one item in an expenditure fails the validation, Oracle Projects rejects all items in the expenditure. The item that failed is marked with a rejection reason; all other items in the expenditure are marked as rejected without a reason.

> **Note:** The transaction import validation logic is different when you run the process PRC: Interface Supplier Costs to import transactions from Oracle Purchasing and Oracle Payables. The processes uses predefined supplier cost transaction sources to import expenditure items and it rejects only the expenditure items that fail validation. The process

imports the valid expenditure items in the expenditure. You can use the Review Transactions window to change the date for a rejected expenditure item. Oracle Projects picks up the revised date for the rejected transaction the next time that you run the process PRC: Interface Supplier Costs.

Transaction Import detects only one error per transaction each time you run the import process. If a single transaction has multiple errors, you will need to run Transaction Import more than once to discover all the errors.

You can correct rejected transactions using the Review Transactions window. After you make your corrections, you can validate the revised information by resubmitting the corrected transactions from the same window. See: Resolving Import Exceptions, page 13-53.

If Transaction Import detects errors during the validation process, you do not need to correct all rejected items to save your transaction information. You need to correct all items, however, before you can successfully import your transactions.

Validating and Loading Transactions

Transaction Import validates data before importing it, to ensure that your transactions contain the appropriate data for Oracle Projects. For a list of the validation criteria, see: Expenditure Item Validation, *Oracle Project Costing User Guide*.

> **Note:** Detailed information on additional column validation is contained in the section: The Transaction Import Interface Table, page 13-27.

Target Expenditure Tables

The Transaction Import program validates all required transaction data in this table. If the transaction data is valid, Transaction Import creates transactions (expenditure items) from the information in the interface table and places the transaction information in the following expenditure tables:

- PA_EXPENDITURE_GROUPS_ALL
- PA_EXPENDITURES_ALL
- PA_EXPENDITURE_ITEMS_ALL
- PA_COST_DISTRIBUTION_LINES_ALL
- PA_EXPENDITURE_COMMENTS

The Transaction Import Interface Table

The Transaction Import interface table (PA_TRANSACTION_INTERFACE_ALL) is the table you populate to import transactions from external sources into Oracle Projects. For a full description of the Transaction Import interface table, including foreign keys and database triggers, refer to Oracle eTRM, which is available on Oracle*MetaLink*.

NULL and NOT NULL Columns

The table description for PA_TRANSACTION_INTERFACE_ALL in Oracle eTRM indicates whether each column in the Transaction Import interface table is a NULL or NOT NULL column.

NOT NULL columns You must enter values for all NOT NULL columns to successfully import an expenditure item.

NULL Columns A NULL column is a column in the interface table that does not require a value. There are two types of NULL columns:

- Some NULL columns are required only for some types of transactions. For example, for usage items, the NON_LABOR_RESOURCE column must be populated. We mark these columns as Conditionally Required. See: Conditionally Required, page 13-27.
- Some NULL columns should never be populated because they are used by the Transaction Import program. These columns are called System Assigned Columns. See System Assigned, page 13-27.

Other Column Requirements

Details about the requirements that you need to consider when you populate the interface table are elaborated below:

Conditionally Required Conditionally required columns may require a value, depending on the value in another column.

Optional Columns marked Optional are for optional transaction information tracking.

You can use these columns to import additional information for the transactions that Transaction Import creates. Transaction Import imports the data that you load into these optional columns, provided that the information passes the validation checks.

System Assigned Oracle Projects assigns values to the system-assigned

columns during the import process.

Important: Your import file must leave these columns blank.

Transaction Interface Control Table

Oracle Projects uses the PA_TRANSACTION_XFACE_CTRL_ALL table to control processing of transactions by the Transaction Import program. You must not insert or update records in this table directly. This table is populated by database triggers when you load or update the PA_TRANSACTION_INTERFACE table.

PA_TRANSACTION_INTERFACE_ALL Column Requirements

This section describes in detail each PA_TRANSACTION_INTERFACE_ALL column including validation and destination information.

TRANSACTION_SOURCE

A *transaction source* identifies the external source of the cost transaction.

Validation: Either a TRANSACTION_SOURCE or USER_TRANSACTION_SOURCE is required on all transactions. If a value is provided, then it must exist in PA_TRANSACTION_SOURCES.TRANSACTION_SOURCE.

Destination: PA_EXPENDITURE_GROUPS_ALL.TRANSACTION_SOURCE and PA_EXPENDITURE_ITEMS_ALL.TRANSACTION_SOURCE

BATCH_NAME

A *batch name* groups one or more expenditures into a single group.

Validation: This column is required on all transactions. All transactions in a batch must have the same transaction source.

Destination: Used to derive PA_EXPENDITURE_GROUPS_ALL.EXPENDITURE_GROUP. Oracle Projects creates an expenditure group by concatenating BATCH_NAME, SYSTEM_LINKAGE_FUNCTION, and INTERFACE_ID.

EXPENDITURE_ENDING_DATE

An *expenditure ending date* is the last day of the expenditure week.

Validation: This column is required on all transactions. The expenditure ending date must be valid based on the expenditure cycle start day defined in Implementation Options. All transactions within an expenditure must have an expenditure item date that is on or before the expenditure ending date. All timecard transactions must have an expenditure item date within the expenditure week date range.

Destination: PA_EXPENDITURES_ALL.EXPENDITURE_ENDING_DATE

The maximum expenditure ending date of all expenditure items processed in a batch becomes the expenditure batch ending date.

EMPLOYEE_NUMBER

An *employee number* is the identifier of the employee that incurred the cost.

Validation: Either EMPLOYEE_NUMBER or PERSON_ID is required on labor and expense report transactions. These values are optional for transactions with other expenditure type classes. If you provide an EMPLOYEE_NUMBER, then it must exist in PER_ALL_PEOPLE_F.EMPLOYEE_NUMBER. If a business group is specified in the PERSON_BUSINESS_GROUP_NAME field, then the employee must be defined in that business group.

Destination: Used to derive PA_EXPENDITURES_ALL.INCURRED_BY_PERSON_ID

ORGANIZATION_NAME

An *organization name* is the name of the organization that incurred the expenditure.

Validation: Either the ORGANIZATION_NAME or ORGANIZATION_ID is required on usage transactions and is optional on other transactions. If you do not provide an ORGANIZATION_NAME, and you do provide an EMPLOYEE_NUMBER, then Transaction Import derives this value from the employee organization. If you provide a value, then it must exist in HR_ALL_ORGANIZATION_UNITS.NAME.

Destination: Used to derive PA_EXPENDITURES_ALL. INCURRED_BY_ORGANIZATION_ID. If you provide both an employee and an organization, then Transaction Import uses the employee information to derive the organization when the Import Employee Organization option is not used. The last employee assignment in the expenditure period is used to derive the employee organization.

EXPENDITURE_ITEM_DATE

An *expenditure item date* is the date cost is incurred.

Validation: This column is required on all transactions. The expenditure item date must be on or before the expenditure ending date. The expenditure item date on timecard transactions must fall within the expenditure week as defined by the expenditure ending date. For additional information about expenditure item date validations, see: Expenditure Item Validations, *Oracle Project Costing User Guide*.

Destination: PA_EXPENDITURE_ITEMS_ALL.EXPENDITURE_ITEM_DATE

PROJECT_NUMBER

A *project number* is a unique identification number of the project that incurred the cost.

Validation: This column is required on all transactions and must exist in

PA_PROJECTS_ALL.SEGMENT1 and PA_PROJECTS_EXPEND_V. The project must have a project status that allows new transactions. The project must not be a project template. If multiple organization support is enabled, then the project must allow charges from the corresponding operating unit.

Destination: Used to derive PA_EXPENDITURE_ITEMS_ALL.PROJECT_ID and PA_COST_DISTRIBUTION_LINES_ALL.PROJECT_ID

TASK_NUMBER

A *task number* is a unique identification number of the task within a project that incurred the cost.

Validation: This column is required on all transactions. The value must exist in PA_TASKS.TASK_NUMBER for the corresponding project number on the transaction and it must be a lowest level task that allows charges.

Destination: Used to derive PA_EXPENDITURE_ITEMS_ALL.TASK_ID and PA_COST_DISTRIBUTION_LINES_ALL.TASK_ID

EXPENDITURE_TYPE

An *expenditure type* is an implementation-defined classification of the incurred cost.

Validation: This column is required on all transactions and must exist in PA_EXPENDITURE_TYPES.EXPENDITURE_TYPE. The expenditure type and expenditure type class combination must exist as an active combination in the PA_EXPEND_TYP_SYS_LINKS table.

Destination: PA_EXPENDITURE_ITEMS_ALL.EXPENDITURE_TYPE

NON_LABOR_RESOURCE

A *non-labor resource* is an implementation-defined asset or pool of assets that incurred the cost.

Validation: This column is required for usage transactions. The value must exist in PA_NON_LABOR_RESOURCES.NON_LABOR_RESOURCE and must be a resource classified by the specified expenditure type.

Destination: PA_EXPENDITURE_ITEMS_ALL.NON_LABOR_RESOURCE

NON_LABOR_RESOURCE_ORG_NAME

A *non-labor resource org name* is the name of the organization that owns the non-labor resource that incurred the cost.

Validation: Either the NON_LABOR_RESOURCE_ORG_NAME or NON_LABOR_RESOURCE_ORG_ID is required for usage transactions. If you provide the NON_LABOR_RESOURCE_ORG_NAME, then it is used to derive HR_ALL_ORGANIZATION_UNITS. ORGANIZATION_ID. The value must exist in PA_NON_LABOR_RESOURCE_ORGS.ORGANIZATION_ID for the specified

non-labor resource.

Destination: Used to derive PA_EXPENDITURE_ITEMS_ALL. ORGANIZATION_ID.

QUANTITY

The *quantity* is the number of units for the transaction based on the unit of measure defined for the expenditure type.

Validation: This column is required on all transactions. QUANTITY, DENOM_RAW_COST, AND ACCT_RAW_COST must be zero for transactions with an expenditure type class of Burden Transaction.

Destination: PA_EXPENDITURE_ITEMS_ALL.QUANTITY

RAW_COST

Raw cost is the cost of the transaction in the project functional currency.

Validation: When you create transactions using the Review Transactions window, this column is automatically derived. However, Transaction Import does not require or use the value.

Destination: PA_EXPENDITURE_ITEMS_ALL.RAW_COST and PA_COST_DISTRIBUTION_LINES_ALL.AMOUNT

EXPENDITURE_COMMENT

An *expenditure comment* describes the transaction in detail.

Validation: None

Destination: PA_EXPENDITURE_COMMENTS.EXPENDITURE_COMMENT

TRANSACTION_STATUS_CODE

A *transaction status code* is a code that indicates the processing status of the transaction.

Validation: This column is required on all transactions and must be set to *P* for transactions to be imported.

Destination: None

TRANSACTION_REJECTION_CODE

A *transaction rejection code* is a code that indicates a transaction was rejected by the Transaction Import program.

Validation: This column is system assigned.

Destination: None

EXPENDITURE_ID

An *expenditure identifier* is a unique system-assigned value that identifies expenditures created by Oracle Projects.

Validation: This column is system assigned and for internal use only.

Destination: PA_EXPENDITURES_ALL.EXPENDITURE_ID

ORIG_TRANSACTION_REFERENCE

An *original transaction reference* is a reference to the original transaction in the external system.

Validation: This column is required on all transactions. Unless the transaction source allows duplicate references, this reference, in combination with the transaction source, uniquely identifies the original transaction. An expenditure item must not already exist with the same identifier.

Destination: PA_EXPENDITURE_ITEMS_ALL.ORIG_TRANSACTION_REFERENCE

ATTRIBUTE_CATEGORY

An *attribute category* is the descriptive flexfield category for the descriptive flexfield information defined on the transaction.

Validation: Validated using the standard Oracle Applications Technology application programming interface (API) for validating attribute categories.

Destination: EXPENDITURE_ITEMS_ALL.ATTRIBUTE_CATEGORY

ATTRIBUTE1 through ATTRIBUTE10

An *attribute* is the descriptive flexfield information defined on the transaction.

Validation: The structure of the information that you enter in these columns (datatypes and value sets) should match the structure of the descriptive flexfield segments that you have defined for the transaction. Otherwise, you will experience validation problems when you try to access the information in the expenditure entry forms. These values are validated using the standard Oracle Applications Technology application programming interface (API) for validating descriptive flexfields. The following information applies to the validation of descriptive flexfield information during transaction import:

- You must populate this field with the *attribute ID* (code) rather than the *meaning*. The meaning will not pass the validation.
- The Transaction Import process validates descriptive flexfield attributes only if the Attribute Category field is populated.
- When you use the transaction import process to import a date as one of the segments in the Expenditure Items descriptive flexfield, the date must be in the

format RRRR/MM/DD HH24:MI:SS. If you attempt to import a date using any other format, then the transaction import process fails validation with the error PA_DFF_VALIDATION_FAILED.

Destination: ATTRIBUTE1 through ATTRIBUTE10 in PA_EXPENDITURE_ITEMS_ALL

RAW_COST_RATE

A *raw cost rate* is the cost rate (raw cost divided by quantity) of the transaction in project functional currency.

Validation: This column is optional and is used only when the transaction source associated with the transaction is defined with the Import Raw Cost Amounts option enabled.

Destination: PA_EXPENDITURE_ITEMS_ALL.RAW_COST_RATE

Oracle Projects uses this information for reporting purposes only.

INTERFACE_ID

An *interface identifier* is a unique system-assigned value that identifies transactions processed by a given concurrent request.

Validation: This column is system assigned and is for internal use only.

Destination: None

UNMATCHED_NEGATIVE_TXN_FLAG

An *unmatched negative transaction flag* is an attribute that indicates that the transaction has a negative amount and should not be matched to an expenditure item that already exists in the system.

Validation: Possible values are Y, N, or null. If this column is set to Y, then Transaction Import bypasses the matching validation logic that is usually executed for adjustments (negative transactions).

Destination: If this column is set to N or null, then Transaction Import finds the matching expenditure item and populates PA_EXPENDITURE_ITEMS_ALL.ADJUSTED_EXPENDITURE_ITEM_ID with the EXPENDITURE_ITEM_ID from the matching expenditure item.

EXPENDITURE_ITEM_ID

An *expenditure item identifier* is a unique system-assigned value that identifies expenditure items created by Oracle Projects.

Validation: This column is system assigned and for internal use only.

Destination: PA_EXPENDITURES_ALL.EXPENDITURE_ITEM_ID

ORG_ID

An *organization identifier* is a unique system-assigned value that identifies an organization classified as an operating unit. If a user enters transactions in the Review Transactions window, then this column is populated with the ORGANIZATION_ID of the operating unit defined for the user.

Validation: If multi-organization support is implemented, then a value is required. The value it must exist in HR_ALL_ORGANIZATION_UNITS.ORGANIZATION_ID and HR_ORGANIZATION_INFORMATION.ORGANIZATION_ID and have an ORG_INFORMATION_CONTEXT of Operating Unit Information.

Destination: PA_EXPENDITURE_GROUPS_ALL.ORG_ID, PA_EXPENDITURES_ALL.ORG_ID, PA_EXPENDITURE_ITEMS_ALL.ORG_ID, and PA_COST_DISTRIBUTION_LINES_ALL.ORG_ID.

DR_CODE_COMBINATION_ID

A *debit code combination identifier* is a unique system-assigned value that identifies a General Ledger account used to record the debit side of an accounting entry. If the transaction source associated with the transaction has the Allow Adjustments option enabled, then Oracle Projects uses this value to create reversing accounting entries.

Validation: If the transaction is associated with a transaction source that has the Raw Cost GL Accounted option enabled, then a value is required and it must exist in GL_CODE_COMBINATIONS.CODE_COMBINATION_ID.

Destination: PA_COST_DISTRIBUTION_LINES_ALL.DR_CODE_COMBINATION_ID

CR_CODE_COMBINATION_ID

A *credit code combination identifier* is a unique system-assigned value that identifies a General Ledger account used to record the credit side of an accounting entry. If the transaction source associated with the transaction has the Allow Adjustments option enabled, and is not a supplier cost transaction source, then Oracle Projects uses this value to create reversing accounting entries. For supplier cost transaction sources, this value is used only for informational purposes in Oracle Projects.

Validation: If the transaction is associated with a transaction source that has the Raw Cost GL Accounted option enabled, then a value is required and must exist in GL_CODE_COMBINATIONS.CODE_COMBINATION_ID.

Destination: PA_COST_DISTRIBUTION_LINES_ALL.CR_CODE_COMBINATION_ID

CDL_SYSTEM_REFERENCE1

A *cost distribution line system reference* is a reference to a record in an external system.

Validation: For supplier invoice transactions created in Oracle Payables, the column holds PO_VENDORS.VENDOR_ID. For payment and discount transactions created in Oracle Payables, the column holds

AP_PAYMENT_HIST_DISTS.PAYMENT_HIST_DIST_ID. For transactions associated with other transaction sources that have the Raw Cost GL Accounted option enabled, a value is optional. For transactions associated with transaction sources that do not have the Raw Cost GL Accounted option enabled, if you provide a value, then it is ignored.

Destination: PA_COST_DISTRIBUTION_LINES_ALL.SYSTEM_REFERENCE1, except when the transaction represents an Oracle Payables payment or discount, in which case the destination is PA_COST_DISTRIBUITON_LINES_ALL.SYSTEM_REFERENCE5.

CDL_SYSTEM_REFERENCE2

A *cost distribution line system reference* is a reference to a record in an external system. For transactions that represent supplier invoices in Oracle Payables, the reference is used to associate the transaction with an invoice number in Oracle Payables. For transactions that represent receipt accruals in Oracle Purchasing, the reference is used to associate the transaction with a purchase order.

Validation: For transactions created by Oracle Payables, the column holds AP_INVOICES_ALL.INVOICE_ID. For transactions created by Oracle Purchasing, the column holds PO_HEADERS_ALL.PO_HEADER_ID. For transactions associated with other transaction sources that have the Raw Cost GL Accounted option enabled, a value is optional. For transactions associated with transaction sources that do not have the Raw Cost GL Accounted option enabled if you provide a value, then it is ignored.

Destination: PA_COST_DISTRIBUTION_LINES_ALL.SYSTEM_REFERENCE and, for transactions created by Oracle Payables or Oracle Purchasing, it is also copied to PA_EXPENDITURE_ITEMS_ALL.DOCUMENT_HEADER_ID.

CDL_SYSTEM_REFERENCE3

A *cost distribution line system reference* is a reference to a record in an external system. For transactions that originate in Oracle Payables, the reference is used to associate the transaction with an invoice line number in Oracle Payables. For transactions that originate in Oracle Purchasing, the reference is used to associate the transaction with a purchase order distribution.

Validation: For transactions created by Oracle Payables, the column holds AP_INVOICE_LINES_ALL.INVOICE_LINE_NUMBER. For transactions created by Oracle Purchasing, the column holds PO_HEADERS_ALL.PO_DISTRIBUTION_ID. For transactions associated with other transaction sources that have the Raw Cost GL Accounted option enabled, a value is optional. For transactions associated with transaction sources that do not have the Raw Cost GL Accounted option enabled if you provide a value, then it is ignored.

Destination: PA_COST_DISTRIBUTION_LINES_ALL.SYSTEM_REFERENCE3, and PA_EXPENDITURE_ITEMS_ALL.DOCUMENT_LINE_NUMBER

GL_DATE

A *general ledger date* is date the transaction is accounted in General Ledger.

Validation: If the transaction is associated with a transaction source that has the Raw Cost GL Accounted option enabled, then a GL date is required.

Destination: PA_COST_DISTRIBUTION_LINES_ALL.GL_DATE

Oracle Projects uses this information for reporting purposes only.

BURDENED_COST

A *burdened cost* is a cost amount that represents the sum of the raw cost plus a burden cost in the project functional currency code.

Validation: When you create transactions using the Review Transactions window, this column is automatically derived. However, Transaction Import does not use or require this value.

Destination: PA_EXPENDITURE_ITEMS_ALL.BURDENED_COST

BURDENED_COST_RATE

A *burdened cost rate* is the burden cost rate (burdened cost divided by quantity) of the transaction in project functional currency.

Validation: This column is optional when transactions have an expenditure type class of Burden Transaction, or when transactions are associated with a transaction source that has the Import Burdened Amounts option enabled. Burden transactions are required to have QUANTITY, DENOM_RAW_COST, and ACCT_RAW_COST attributes equal to zero. For all other transactions, the value is ignored.

Destination: PA_EXPENDITURE_ITEMS_ALL.BURDEN_COST_RATE

Oracle Projects uses this information for reporting purposes only.

SYSTEM_LINKAGE

A *system linkage* is a system-defined value that indicates the expenditure type class of the transaction.

Validation: This column is optional. If you do not provide a value, then the default system linkage defined for the transaction source is used. If you provide a value, then the value must exist in PA_EXPENDITURE_TYPES.SYSTEM_LINKAGE_FUNCTION and PA_EXPEND_TYP_SYS_LINKS. SYSTEM_LINKAGE_FUNCTION for the corresponding EXPENDITURE_TYPE on the transaction.

Destination: PA_EXPENDITURE_ITEMS_ALL.SYSTEM_LINKAGE_FUNCTION

TXN_INTERFACE_ID

A *transaction interface identifier* is a unique system-defined value that identifies each transaction loaded into the interface table.

Validation: This column is system assigned and for internal use only.

Destination: None

USER_TRANSACTION_SOURCE

A *user transaction source* is a user-defined name for a transaction source.

Validation: This column is required when a TRANSACTION_SOURCE value is not provided. If a value is provided, then it must exist in PA_TRANSACTION_SOURCES.USER_TRANSACTION_SOURCE.

Destination: This value is used to derive PA_EXPENDITURE_GROUPS_ALL.TRANSACTION_SOURCE and PA_EXPENDITURE_ITEMS_ALL.TRANSACTION_SOURCE.

CREATED_BY

The *created by* attribute represents the system-assigned identifier of the user that created transaction.

Validation: This column is required and must be a number.

Destination: When transactions are created using the Review Transactions window, the FND_USERS.USER_ID defined for the user creating the transactions is stored in this column. However, this value is not used when Transaction Import creates expenditure items for the transaction. Transaction Import uses the FND_USERS.USER_ID defined for the user that runs the Transaction Import concurrent program to populate the CREATED_BY attribute in the PA_EXPENDITURE_GROUPS_ALL, PA_EXPENDITURES_ALL, and PA_EXPENDITURE_ITEMS_ALL tables.

CREATION_DATE

A *creation date* is the date the transaction is created in the system.

Validation: This column is required and must be a valid date.

Destination: When you create transactions using the Review Transactions window, the system date is stored in this column. However, this value is not used when Transaction Import creates expenditure items for the transaction. When you run the Transaction Import concurrent program, the program uses the system date to populate the CREATION_DATE attribute in the PA_EXPENDITURE_GROUPS_ALL, PA_EXPENDITURES_ALL, and PA_EXPENDITURE_ITEMS_ALL tables.

LAST_UPDATED_BY

The *last updated by* attribute represents the system-defined identifier of the user that last updated the transaction.

Validation: This column is required and must be a number.

Destination: When transactions are updated using the Review Transactions window, the FND_USERS.USER_ID defined for the user updating the transactions is stored in this column. However, this value is not used when Transaction Import creates expenditure items for the transaction. Transaction Import uses the

FND_USERS.USER_ID defined for the user that runs the Transaction Import concurrent program to populate the LAST_UPDATED_BY attribute in the PA_EXPENDITURE_GROUPS_ALL, PA_EXPENDITURES_ALL, and PA_EXPENDITURE_ITEMS_ALL tables.

LAST_UPDATE_DATE

A *last update date* is the date the transaction is last updated in the system.

Validation: This column is required and must be a valid date.

Destination: When you update transactions using the Review Transactions window, the system date is stored in this column. However, this value is not used when Transaction Import creates expenditure items for the transaction. When you run Transaction Import concurrent program, the program uses the system date to populate the LAST_UPDATE_DATE attribute in the PA_EXPENDITURE_GROUPS_ALL, PA_EXPENDITURES_ALL, and PA_EXPENDITURE_ITEMS_ALL tables.

RECEIPT_CURRENCY_AMOUNT

A *receipt currency amount* is the amount of an expense report transaction in the original currency.

Validation: This column is required when the SYSTEM_LINKAGE_FUNCTION is Expense Reports and the RECEIPT_CURRENCY_CODE is different from the DENOM_CURRENCY_CODE.

Destination: PA_EXPENDITURE_ITEMS_ALL.RECEIPT_CURRENCY_AMOUNT

RECEIPT_CURRENCY_CODE

A *receipt currency code* is the currency code for the expense report receipt currency.

Validation: This column is optional and only used when the SYSTEM_LINKAGE_FUNCTION is Expense Reports. If you provide a value, then it must exist in FND_CURRENCIES_VL.CURRENCY_CODE. In addition, the FND_CURRENCIES_VL.ENABLED_FLAG must be set to *Y* and active as of the expenditure item date on the transaction.

Destination: PA_EXPENDITURE_ITEMS_ALL.RECEIPT_CURRENCY_CODE

RECEIPT_EXCHANGE_RATE

A *receipt exchange rate* is the exchange rate used to convert the receipt currency to the transaction (reimbursement) currency for expense reports.

Validation: This column is optional and only used when the SYSTEM_LINKAGE_FUNCTION is Expense Reports.

Destination: PA_EXPENDITURE_ITEMS_ALL.RECEIPT_EXCHANGE_RATE

DENOM_CURRENCY_CODE

A *denominated currency code* is the code of the currency used for the transaction.

Validation: This column is required on all transactions and must be a valid FND_CURRENCIES_VL.CURRENCY_CODE. In addition, the FND_CURRENCIES_VL.ENABLED_FLAG must be set to *Y* as of the expenditure item date.

Destination: PA_EXPENDITURE_ITEMS_ALL.DENOM_CURRENCY_CODE and PA_COST_DISTRIBUTION_LINES_ALL.DENOM_CURRENCY_CODE

DENOM_RAW_COST

A *denominated raw cost* is the raw cost amount in the transaction currency.

Validation: This column is required when the transaction source is defined with the Import Raw Cost Amounts option enabled. QUANTITY, DENOM_RAW_COST, AND ACCT_RAW_COST attributes must be zero for transactions with an expenditure type class of Burden Transaction.

Destination: PA_EXPENDITURE_ITEMS_ALL.DENOM_RAW_COST and PA_COST_DISTRIBUTION_LINES_ALL.DENOM_RAW_COST

DENOM_BURDENED_COST

A *denominated burdened cost* is the burdened cost amount in the transaction currency.

Validation: This column is required for transactions with an expenditure type class of Burden Transaction, and for transactions that are associated with a transaction source that has the Import Burdened Amounts option enabled. Burden transactions are required to have QUANTITY, DENOM_RAW_COST, ACCT_RAW_COST attributes equal to zero. For all other transactions, the value is ignored.

Destination: PA_EXPENDITURE_ITEMS_ALL.DENOM_BURDENED_COST and PA_COST_DISTRIBUTION_LINES_ALL. DENOM_BURDENED_COST

ACCT_RATE_DATE

An *accounted rate date* is the date used for converting the transaction to the functional currency of the operating unit.

Validation: This column is required when the transaction source associated with the transaction has the Raw Cost GL Accounted option enabled. This column is optional when the ACCT_RATE_TYPE on the transaction is *User*.

Destination: PA_EXPENDITURE_ITEMS_ALL.ACCT_RATE_DATE and PA_COST_DISTRIBUTION_LINES_ALL.ACCT_RATE_DATE

ACCT_RATE_TYPE

An *accounted rate type* is the conversion type used to convert the transaction to the

functional currency of the operating unit.

Validation: This column is optional when the transaction source associated with the transaction has the Raw Cost GL Accounted option enabled. The value must exist in PA_CONVERSION_TYPES_V.CONVERSION_TYPE.

Destination: PA_EXPENDITURE_ITEMS_ALL.ACCT_RATE_TYPE and PA_COST_DISTRIBUTION_LINES_ALL.ACCT_RATE_TYPE

ACCT_EXCHANGE_RATE

An *accounted exchange rate* is the rate used to convert the transaction to the functional currency of the operating unit.

Validation: This column is required when the transaction source associated with the transaction has the Raw Cost GL Accounted option enabled and the ACCT_RATE_TYPE on the transaction is *User*.

Destination: PA_EXPENDITURE_ITEMS_ALL.ACCT_EXCHANGE_RATE and PA_COST_DISTRIBUTION_LINES_ALL. ACCT_EXCHANGE_RATE

ACCT_RAW_COST

An *accounted raw cost* is the raw cost converted to the functional currency of the operating unit.

Validation: This column is required when the transaction source associated with the transaction has the Raw Cost GL Accounted option enabled. The functional raw cost is calculated using the provided ACCT_RATE_DATE and ACCT_RATE_TYPE. The calculated value must be within the ACCT_EXCHANGE_ROUNDING_LIMIT of the provided ACCT_RAW_COST. For all other transactions, the value is ignored.

Destination: PA_EXPENDITURE_ITEMS_ALL.ACCT_RAW_COST and PA_COST_DISTRIBUTION_LINES_ALL.ACCT_RAW_COST

ACCT_BURDENED_COST

An *accounted burdened cost* is the burdened cost converted to the functional currency of the operating unit.

Validation: This column is required when:

- The transaction source associated with the transaction has the Raw Cost GL Accounted option enabled.
- Transactions either have an expenditure type class of Burden Transaction, or are associated with a transaction source that has the Import Burdened Amounts option enabled. Burden transactions are required to have QUANTITY, DENOM_RAW_COST, and ACCT_RAW_COST attributes equal to zero.

Destination: PA_EXPENDITURE_ITEMS_ALL. ACCT_BURDENED_COST

ACCT_EXCHANGE_ROUNDING_LIMIT

An *accounted exchange rounding limit* is the rounding limit of the functional currency of the operating unit.

Validation: This column is optional. If the derivation of the functional currency raw cost is within the rounding limit, then the transaction is accepted, otherwise it is rejected. If the value of ACCT_EXCHANGE_ROUNDING_LIMIT is null, then the rounding limit value used is zero.

Destination: PA_EXPENDITURE_ITEMS_ALL.ACCT_ROUNDING_LIMIT

PROJECT_CURRENCY_CODE

A *project currency code* is the code of the currency defined for the project.

Validation: This column is optional. If you do not provide a value, then Transaction Import derives the value.

Destination: PA_EXPENDITURE_ITEMS_ALL.PROJECT_CURRENCY_CODE and PA_COST_DISTRIBUTION_LINES_ALL.PROJECT_CURRENCY_CODE

PROJECT_RATE_DATE

A *project rate date* is the date used to convert the transaction to the project currency.

Validation: This column is optional.

Destination: PA_EXPENDITURE_ITEMS_ALL.PROJECT_RATE_DATE and PA_COST_DISTRIBUTION_LINES_ALL.PROJECT_RATE_DATE

PROJECT_RATE_TYPE

A *project rate type* is the rate type used for converting the transaction to the project currency.

Validation: This column is optional. If you provide a value, then it must exist in PA_CONVERSION_TYPES_V.CONVERSION_TYPE.

Destination: PA_EXPENDITURE_ITEMS_ALL.PROJECT_RATE_TYPE and PA_COST_DISTRIBUTION_LINES_ALL.PROJECT_RATE_TYPE

PROJECT_EXCHANGE_RATE

A *project exchange rate* is the rate used to convert the transaction to project currency.

Validation: This column is required when the PROJECT_RATE_TYPE is set to *User*.

Destination: PA_EXPENDITURE_ITEMS_ALL.PROJECT_EXCHANGE_RATE and PA_COST_DISTRIBUTION_LINES_ALL.PROJECT_EXCHANGE_RATE

ORIG_EXP_TXN_REFERENCE1

An *original expenditure transaction reference* is an identifier of a transaction in an external system.

Validation: For transactions created in Oracle Payables, this column contains the value of AP_INVOICE_DISTRIBUTIONS_ALL.INVOICE_ID. For all other transactions, this column is not validated and is optional.

Destination: PA_EXPENDITURES_ALL.ORIG_EXP_TXN_REFERENCE1

This column is used to determine how to group transactions into an expenditure group. The following attributes are used in the following order to determine how to group transactions into an expenditure group:

1. EXPENDITURE_ENDING_DATE
2. INCURRED_BY_PERSON_ID
3. ORGANIZATION_ID
4. ORIG_EXP_TXN_REFERENCE1
5. ORIG_USER_EXP_TXN_REFERENCE
6. VENDOR_ID
7. ORIG_EXP_TXN_REFERENCE2
8. ORIG_EXP_TXN_REFERENCE3
9. ACCRUAL_FLAG
10. PERSON_TYPE

ORIG_EXP_TXN_REFERENCE2

An *original expenditure transaction reference* is an identifier of a transaction in an external system.

Validation: This column is not validated and is optional.

Destination: PA_EXPENDITURES_ALL.ORIG_EXP_TXN_REFERENCE2

This column is used to determine how to group transactions into an expenditure group. For additional information about how expenditure groups are defined, see: ORIG_EXP_TXN_REFERENCE1, page 13-42.

ORIG_EXP_TXN_REFERENCE3

An *original expenditure transaction reference* is an identifier of a transaction in an external

system.

Validation: This column is not validated and is optional.

Destination: PA_EXPENDITURES_ALL.ORIG_EXP_TXN_REFERENCE3

This column is used to determine how to group transactions into an expenditure group. For additional information about how expenditure groups are defined, see: ORIG_EXP_TXN_REFERENCE1, page 13-42.

ORIG_USER_EXP_TXN_REFERENCE

An *original user expenditure transaction reference* is an identifier of a transaction in an external system.

Validation: For transactions created in Oracle Payables, this column contains the value of AP_INVOICES_ALL.INVOICE_NUM. For all other transactions, this column is not validated and is optional.

Destination: PA_EXPENDITURES_ALL. ORIG_USER_EXP_TXN_REFERENCE

This column is used to determine how to group transactions into an expenditure group. For additional information about how expenditure groups are defined, see: ORIG_EXP_TXN_REFERENCE1, page 13-42.

VENDOR_NUMBER

A vendor number is a unique identification number of the supplier that provided the goods or services for the transaction.

Validation: Either VENDOR_NUMBER or VENDOR_ID is required on transactions that have expenditure type class of Supplier Invoice. If you provide a VENDOR_NUMBER, then it must exist in PO_VENDORS.SEGMENT1.

Destination: This column is used to derive PA_EXPENDITURES_ALL.VENDOR_ID.

OVERRIDE_TO_ORGANIZATION_NAME

An *override to organization name* is the name of the organization that incurred the cost.

Validation: This column is optional and you can provide either an OVERRIDE_TO_ORGANIZATION_NAME or OVERRIDE_TO_ORGANIZATION_ID. If you provide an OVERRIDE_TO_ORGANIZATION_NAME, then it must exist in HR_ALL_ORGANIZATION_UNITS.NAME.

Destination: This column is used to derive PA_EXPENDITURE_ITEMS_ALL.OVERRIDE_TO_ORGANIZATION_ID.

REVERSED_ORIG_TXN_REFERENCE

A *reversed original transaction reference* indicates that the transaction reverses a transaction that already exists in the system.

Validation: This column is optional. If you provide a value, then it must exist in

PA_EXPENDITURE_ITEMS_ALL.ORIG_TRANSACTION_REFERENCE.

Destination: This column is used to derive PA_EXPENDITURE_ITEMS_ALL.ADJUSTED_EXPENDITURE_ITEM_ID.

BILLABLE_FLAG

A *billable flag* is an attribute that indicates whether the transaction is billable when the project is a contract project, or whether the transaction is capitalizable when the project is a capital project.

Validation: Possible values are Y, N, and null.

Destination: PA_EXPENDITURE_ITEMS_ALL.BILLABLE_FLAG

If you do not provide a value, then the value is derived based on task and transaction control settings.

PERSON_BUSINESS_GROUP_NAME

A *person business group name* is the name of an organization that has a business group classification and is defined for the person that incurred the cost.

Validation: This column is required when an employee is defined in more than one business group. If you provide a value is provided, then it must exist in HR_ALL_ORGANIZATION_UNITS.NAME and in HR_ORGANIZATION_INFORMATION.ORGANIZATION_ID and have an ORG_INFORMATION_CONTEXT of Business Group Information. Alternatively, you can provide the value of PERSON_BUSINESS_GROUP_ID instead of PERSON_BUSINESS_GROUP_NAME.

Destination: If you provide a value, then it is used to derive a PERSON_BUSINESS_GROUP_ID which, in turn, is used to derive a PA_EXPENDITURES_ALL.INCURRED_BY_PERSON_ID.

PROJFUNC_CURRENCY_CODE

A *project functional currency code* is the code of the functional currency defined for the project.

Validation: This column is optional. If you do not provide a value, then Transaction Import derives the value.

Destination: PA_EXPENDITURE_ITEMS_ALL.PROJFUNC_CURRENCY_CODE

PROJFUNC_COST_RATE_TYPE

A *project functional cost rate type* is the rate type used for converting the transaction to project functional currency.

Validation: This column is optional. If you provide a value, then it must exist in PA_CONVERSION_TYPES_V.CONVERSION_TYPE.

Destination: PA_EXPENDITURE_ITEMS_ALL.PROJFUNC_COST_RATE_TYPE and PA_COST_DISTRIBUTION_LINES_ALL.PROJFUNC_COST_RATE_TYPE

PROJFUNC_COST_RATE_DATE

A *project functional cost rate date* is the date used to convert the transaction to the project functional currency.

Validation: This column is optional.

Destination: PA_EXPENDITURE_ITEMS_ALL.PROJFUNC_COST_RATE_DATE and PA_COST_DISTRIBUTION_LINES_ALL.PROJFUNC_COST_RATE_DATE

PROJFUNC_COST_EXCHANGE_RATE

A *project functional cost exchange rate* is the rate used to convert the transaction to project functional currency.

Validation: This column is required when the PROJFUNC_COST_RATE_TYPE is set to *User*.

Destination: PA_EXPENDITURE_ITEMS_ALL.PROJFUNC_COST EXCHANGE_RATE and PA_COST_DISTRIBUTION_LINES_ALL.PROJFUNC_COST_EXCHANGE_RATE

PROJECT_RAW_COST

Project raw cost is the cost of the transaction in the project currency.

Validation: When you create transactions using the Review Transactions window, this column is automatically derived. However, Transaction Import does not use or require a value for this column.

Destination: PA_EXPENDITURE_ITEMS_ALL.PROJECT_RAW_COST and PA_COST_DISTRIBUTION_LINES_ALL.PROJECT_RAW_COST

PROJECT_BURDENED_COST

Project burdened cost is a cost amount that represents the sum of the raw cost plus burden cost in the project currency code.

Validation: When you create transactions using the Review Transactions window, this column is automatically derived. However, Transaction Import does not use or require a value for this column.

Destination: PA_EXPENDITURE_ITEMS_ALL.BURDENED_COST

ASSIGNMENT_NAME

An *assignment name* is the name of an assignment. An assignment is a work position on a project that is associated with a specific person resource.

Validation: This column is optional and is used only when the transaction is a timecard or expense report. You can provide either the ASSIGNMENT_ID or

ASSIGNMENT_NAME. If you provide an ASSIGNMENT_NAME, then it used to derive the ASSIGNMENT_ID and it must exist in PA_PROJECT_ASSIGNMENTS.ASSIGNMENT_ID.

Destination: This column is used to derive PA_EXPENDITURE_ITEMS_ALL.ASSIGNMENT_ID.

WORK_TYPE_NAME

A work type name is the name of a work type. A work type is an implementation-defined classification of work.

Validation: This column is optional and you can provide either a WORK_TYPE_NAME or WORK_TYPE_ID. If you provide a WORK_TYPE_NAME, then it is used to derive a WORK_TYPE_ID and it must exist in PA_WORK_TYPES.WORK_TYPE_ID.

Destination: This column is used to derive PA_EXPENDITURE_ITEMS_ALL.WORK_TYPE_ID and PA_COST_DISTRIBUTION_LINES_ALL.WORK_TYPE_ID.

CDL_SYSTEM_REFERENCE4

A *cost distribution line system reference* is a reference to a record in an external system.

Validation: When the transaction is a payment or discount created by Oracle Payables, the column holds AP_INVOICE_PAYMENTS.INVOICE_PAYMENT_ID. When the transaction is created by Oracle Purchasing, the column holds RCV_TRANSACTIONS.TRANSACTION_ID. For transactions associated with other transaction sources that have the Raw Cost GL Accounted option enabled, a value is optional. For transactions associated with transaction sources that do not have the Raw Cost GL Accounted option enabled, if you provide a value, then it is ignored.

Destination: COST_DISTRIBUTION_LINES_ALL.SYSTEM_REFERENCE4

When the transaction is a payment or discount created by Oracle Payables, it is also copied to the PA_EXPENDITURE_ITEMS_ALL.DOCUMENT_PAYMENT_ID column. When the transaction is created by Oracle Purchasing, it is also copied to PA_EXPENDITURE_ITEMS_ALL. DOCUMENT_DISTRIBUTION_ID.

ACCRUAL_FLAG

An *accrual flag* is an attribute that indicates if a transaction is a period end accrual.

Validation: This column is optional. Possible values are Y, N, and null.

Destination: PA_EXPENDITURE_GROUPS_ALL.PERIOD_ACCRUAL_FLAG

PROJECT_ID

A *project identifier* is a unique system-assigned value that identifies the project number.

Validation: This column is system assigned and for internal use only.

Destination: PA_EXPENDITURE_ITEMS_ALL.PROJECT_ID and PA_COST_DISTRIBUTION_LINES_ALL.PROJECT_ID

TASK_ID

A *task identifier* is a unique system-assigned value that identifies the task number.

Validation: This column is system assigned and for internal use only.

Destination: PA_EXPENDITURE_ITEMS_ALL.TASK_ID and PA_COST_DISTRIBUTION_LINES_ALL.TASK_ID

PERSON_ID

A *person identifier* is a unique system-assigned value that identifies the person that incurred the cost.

Validation: Either EMPLOYEE_NUMBER or PERSON_ID is required on labor and expense report transactions, but is optional for transactions with other expenditure type classes. If you provide the PERSON_ID, then it must exist in PER_ALL_PEOPLE_F.PERSON_ID. If a business group is specified in the PERSON_BUSINESS_GROUP_NAME field, then the employee must be defined in that business group.

Destination: PA_EXPENDITURES_ALL.INCURRED_BY_PERSON_ID

ORGANIZATION_ID

An *organization identifier* is a unique system-assigned value that identifies the organization that incurred the expenditure.

Validation: Either the ORGANIZATION_NAME or ORGANIZATION_ID is required on usage transactions and is optional on other transactions. If you provide an EMPLOYEE_NUMBER, then this column can be null, in which case Transaction Import derives this value from the employee organization. If you provide an ORGANIZATION_ID, then it must exist in HR_ALL_ORGANIZATION_UNITS.ORGANIZATION_ID.

Destination: PA_EXPENDITURES_ALL. INCURRED_BY_ORGANIZATION_ID

The last employee assignment in the expenditure period is used to derive the organization.

NON_LABOR_RESOURCE_ORG_ID

A *non-labor resource organization identifier* is a unique system-assigned value that identifies the organization that owns a non-labor resource that incurred the cost.

Validation: Either the NON_LABOR_RESOURCE_ORG_NAME or NON_LABOR_RESOURCE_ORG_ID is required for usage transactions. If you provide

NON_LABOR_RESOURCE_ORG_ID, then it must exist in PA_NON_LABOR_RESOURCE_ORGS.ORGANIZATION_ID for the specified non-labor resource.

Destination: PA_EXPENDITURE_ITEMS_ALL.ORGANIZATION_ID

VENDOR_ID

A *vendor identifier* is a unique system-assigned value that identifies the supplier that provided the goods or services associated with the transaction.

Validation: This column is required on transactions that have expenditure type class of Supplier Invoice if you do not provide a VENDOR_NUMBER. If you provide a value, then it must exist in PO_VENDORS.VENDOR_ID.

Destination: PA_EXPENDITURES_ALL.VENDOR_ID

OVERRIDE_TO_ORGANIZATION_ID

An *override to organization identifier* is a unique system-assigned value that identifies the organization that incurred the cost.

Validation: For transactions created in Oracle Payables, this column holds AP_INVOICE_DISTRIBUTIONS_ALL.EXPENDITURE_ORGANIZATION_ID. For other transactions this column is optional and you can provide either an OVERRIDE_TO_ORGANIZATION_NAME or OVERRIDE_TO_ORGANIZATION_ID. If you provide an OVERRIDE_TO_ORGANIZATION_ID, then it must exist in HR_ALL_ORGANIZATION_UNITS.ORGANIZATION_ID.

Destination: PA_EXPENDITURE_ITEMS_ALL.OVERRIDE_TO_ORGANIZATION_ID

ASSIGNMENT_ID

An *assignment identifier* is a unique system-assigned value that identifies an assignment. An assignment is a work position on a project that is associated with a specific person resource.

Validation: This column is optional and is used only when the transaction is a timecard or expense report. You can provide either the ASSIGNMENT_ID or ASSIGNMENT_NAME. If you provide an ASSIGNMENT_ID, then it must exist in PA_PROJECT_ASSIGNMENTS.ASSIGNMENT_ID.

Destination: PA_EXPENDITURE_ITEMS_ALL.ASSIGNMENT_ID

WORK_TYPE_ID

A *work type identifier* is a unique system-assigned value that identifies the work type. A work type is an implementation-defined classification of work.

Validation: This column is optional and you can provide either a WORK_TYPE_NAME or WORK_TYPE_ID. If you provide a WORK_TYPE_ID, then it must exist in PA_WORK_TYPES.WORK_TYPE_ID.

Destination: PA_EXPENDITURE_ITEMS_ALL.WORK_TYPE_ID

PERSON_BUSINESS_GROUP_ID

A *person business group identifier* is a unique system-assigned value that identifies an organization that has a business group classification and is defined for the person that incurred the cost.

Validation: This column is required when an employee is defined in more than one business group. If you provide a value, then it must exist in HR_ALL_ORGANIZATION_UNITS.ORGANIZATION_ID and in HR_ORGANIZATION_INFORMATION.ORGANIZATION_ID and have an ORG_INFORMATION_CONTEXT of Business Group Information. Alternatively, you can provide the value of PERSON_BUSINESS_GROUP_NAME instead of PERSON_BUSINESS_GROUP_ID.

Destination: If you provide a value, then this column is used to derive PA_EXPENDITURES_ALL.INCURRED_BY_PERSON_ID.

INVENTORY_ITEM_ID

An *inventory item identifier* is a unique system-defined value that identifies inventory items.

Validation: This column is system assigned on transactions created by Oracle Project Manufacturing and is for internal use only.

Destination: PA_EXPENDITURE_ITEMS_ALL.INVENTORY_ITEM_ID

WIP_RESOURCE_ID

A *work-in-process resource identifier* is a unique system-defined value that identifies labor or non-labor resources on work-in-process transactions.

Validation: This column is system assigned on transactions created by Oracle Project Manufacturing and is for internal use only.

Destination: PA_EXPENDITURE_ITEMS_ALL.WIP_RESOURCE_ID

UNIT_OF_MEASURE

A *unit of measure* is a classification created in Oracle Project Manufacturing.

Validation: This column is system assigned and used only on transactions created in Oracle Project Manufacturing.

Destination: PA_EXPENDITURE_ITEMS_ALL.UNIT_OF_MEASURE

PO_NUMBER

A *purchase order number* identifies purchase order documents created in Oracle Purchasing.

Validation: This column is optional and you can provide either PO_NUMBER or PO_HEADER_ID. When you provide a value, it is only used when the transaction is for a contingent worker. If you provide values for both columns, then PO_HEADER_ID is used during validation. If you provide a PO_NUMBER, then it must exist in PO_HEADERS_ALL.SEGMENT1.

Destination: None

PO_HEADER_ID

A *purchase order identifier* is a system-assigned unique value that identifies purchase order documents created in Oracle Purchasing.

Validation: This column is optional and you can provide either the PO_NUMBER or PO_HEADER_ID. When you provide a value, it is only used when the transaction is for a contingent worker. If you provide values for both columns, then the PO_HEADER_ID is used during validation. If you provide a PO_HEADER_ID is provided, then it must exist in PO_HEADERS_ALL.HEADER_ID.

Destination: None

PO_LINE_NUM

A *purchase order line number* identifies specific lines on a purchase order document created by Oracle Purchasing.

Validation: This column is optional and you can provide either the PO_LINE_NUM or the PO_LINE_ID. When you provide a value, it is only used when the transaction is for a contingent worker. If you provide values for both columns, then the PO_LINE_ID is used during validation. If you provide the PO_LINE_NUM, then it must exist in PO_LINES_ALL.LINE_NUM for the purchase order specified by PO_NUMBER or PO_HEADER_ID. At least one distribution associated with the purchase order line must be related to the project and task specified for the transaction.

Destination: Used to derive to derive PA_EXPENDITURE_ITEMS_ALL.PO_LINE_ID.

PO_LINE_ID

A *purchase order line identifier* is a system-defined unique value that identifies individual lines on purchase order documents created in Oracle Purchasing.

Validation: This column is optional and you can provide either the PO_LINE_NUM or the PO_LINE_ID. When you provide a value, it is only used when the transaction is for a contingent worker. If you provide values for both columns, then the PO_LINE_ID is used during validation. If you provide the PO_LINE_ID, then it must exist in PO_LINES_ALL.PO_LINE_ID for the purchase order specified by PO_NUMBER or PO_HEADER_ID. At least one distribution associated with the purchase order line must be related to the project and task specified for the transaction.

Destination: PA_EXPENDITURE_ITEMS_ALL.PO_LINE_ID

PERSON_TYPE

A *person type* is the type of person that incurred the cost for the transaction.

Validation: This column is optional for timecard and expense reports. Possible values are:

- **CWK** - Contingent worker
- **EMP** - Employee
- **null**

If you do not provide a value, then the system sets the value to EMP.

Destination: None

PO_PRICE_TYPE

A *purchase order price type* is an attribute that identifies the contingent worker rate for the transaction.

Validation: This column is optional. If you provide a value, then it is only used when the transaction is for a contingent worker and it must exist in PO_LINES_ALL.PRICE_TYPE_LOOKUP_CODE for the purchase order line defined on the transaction.

Destination: PA_EXPENDITURE_ITEMS_ALL.PO_PRICE_TYPE

ADJUSTED_EXPENDITURE_ITEM_ID

An *adjusted expenditure item identifier* is a unique system-assigned value that indicates that the transaction reverses another transaction and refers to the original transaction.

Validation: This column is system assigned and for internal use only.

Destination: PA_EXPENDITURE_ITEMS_ALL.ADJUSTED_EXPENDITURE_ITEM_ID

FC_DOCUMENT_TYPE

A *funds check document type* is a system-assigned attribute that indicates whether the transaction is required to undergo funds checking.

Validation: This column is system assigned and is for internal use only on supplier cost transactions created in Oracle Payables or Oracle Purchasing. The valid values are as follows:

- **CMT** - Commitments
- **ACT** - Actuals
- **ALL** - Commitments and Actuals

- **NOT** - None

Destination: None

DOCUMENT_TYPE

A *document type* is a system-assigned attribute that identifies the type of document created in Oracle Payables or Oracle Purchasing.

Validation: This column is system assigned and for internal use only. If the transaction was created by Oracle Payables, then the column holds AP_INVOICES_ALL.INVOICE_TYPE_LOOKUP_CODE. If the transaction was created by Oracle Purchasing, then the column holds RCV_TRANSACTIONS.DESTINATION_TYPE_CODE. If a value is provided on any other type of transaction, then it is ignored.

Destination: PA_EXPENDITURE_ITEMS_ALL.DOCUMENT_TYPE

DOCUMENT_DISTRIBUTION_TYPE

A *document distribution type* is a system-assigned attribute that indicates the type of distribution on transactions created by Oracle Payables or Oracle Purchasing.

Validation: This column is system assigned and for internal use only. If the transaction was created by Oracle Payables, then the column holds AP_INVOICE_DISTRIBUTIONS_ALL.LINE_TYPE_LOOKUP_CODE. If the transaction was created by Oracle Purchasing, then the column holds RCV_TRANSACTIONS.TRANSACTION_TYPE.

Destination: PA_EXPENDITURE_ITEMS_ALL.DOCUMENT_DISTRIBUTION_TYPE

SI_ASSETS_ADDITION_FLAG

The *supplier invoice assets addition flag* is a system-assigned attribute that indicates the status of the transaction in relation to Oracle Assets.

Validation: The column is system assigned and for internal use only. It only applies to supplier cost transactions created in Oracle Payables. The valid values for this column are as follows:

- **Y** - The transaction has been interfaced to Oracle Assets.
- **N** - The transaction is not eligible to be interfaced to Oracle Assets.
- **T** - The transaction is pending interface to Oracle Assets.

Destination: PA_COST_DISTRIBUTION_LINES_ALL.SI_ASSETS_ADDITION_FLAG

CDL_SYSTEM_REFERENCE5

A *cost distribution line system reference* is a reference to a record in an external system.

Validation: For transactions created by Oracle Payables, the column holds AP_INVOICE_DISTRIBUTIONS_ALL. INVOICE_DISTRIBUTION_ID. For transactions associated with other transaction sources that have the Raw Cost GL Accounted option enabled, a value is optional. For transactions associated with transaction sources that do not have the Raw Cost GL Accounted option enabled, if you provide a value, then it is ignored.

Destination: COST_DISTRIBUTION_LINES_ALL.SYSTEM_REFERENCE5

When the transaction is created by Oracle Payables, it is also copied to PA_EXPENDITURE_ITEMS_ALL.DOCUMENT_DISTRIBUTION_ID.

SC_XFER_CODE

A *supplier cost transfer code* is a system-assigned attribute that indicates the General Ledger transfer status code of the transaction in Oracle Payables or Oracle Purchasing.

Validation: This column is system assigned and for internal use only. It only applies to transactions created by Oracle Payables or Oracle Purchasing.

Destination: PA_COST_DISTRIBUTION_LINES_ALL.TRANSFER_STATUS_CODE

ADJUSTED_TXN_INTERFACE_ID

An *adjusted transaction interface identifier* is a system-assigned attribute that contains a reference to the transaction interface identifier of an adjusted transaction.

Validation: This column is system assigned and for internal use only. The column only applies to supplier cost transactions created by Oracle Payables or Oracle Purchasing. The column is not used for labor or usage transactions.

Destination: None

NET_ZERO_ADJUSTMENT_FLAG

A *net zero adjustment flag* is a system-assigned attribute that indicates the transaction does not have an impact on the cost amount (in other words, a net-zero value).

Validation: This column is system assigned and is for internal use only. The column is only used for transactions created by Oracle Payables or Oracle Purchasing.

Destination: PA_EXPENDITURE_ITEMS_ALL.NET_ZERO_ADJUSTMENT_FLAG

Resolving Import Exceptions

You must correct rejected transactions before you can load them into Oracle Projects. You can correct transaction data in Oracle Projects using the Review Transactions window, or in your external feeder system before you reload the data.

If you correct exceptions in your external system, you must delete the rejected rows from the interface table before reloading the corrected transactions.

This section describes how to correct rejected data, and describes reports you can use to

help resolve exceptions.

Examples of Rejection Reason Codes

Transaction Import may reject importing transactions for a variety of reasons. Examples of rejection reasons and their descriptions are shown in the following list:

DUPLICATE_ITEM	A transaction with the same transaction source and original transaction reference has already been imported into Oracle Projects (and the transaction source options do not allow duplicate references).
INVALID_END_DATE	The value for the expenditure ending date is not a valid week ending date.
INVALID_PROJECT	No project exists with the project number specified.
ITEM_NOT_IN_WEEK	The expenditure item date for a timecard item does not fall within the timecard expenditure week.
PA_EXP_TASK_TC	The transaction violates an expenditure transaction control at the task level.
PA_EXP_TYPE_INACTIVE	The expenditure item date falls outside the effective dates of the expenditure type. Change the expenditure item date, expenditure type, or expenditure type dates.

You can get a complete listing of all the rejection reasons from PA_LOOKUPS under the lookup type TRANSACTION REJECTION REASON.

Viewing Rejected Transactions

Transaction records that fail the validation process remain in the interface table.

If any one expenditure item in an expenditure fails validation, then Oracle Projects rejects the entire expenditure and updates each expenditure item in the expenditure with a status of R (Rejected). However, only the expenditure item that was rejected appears on the exception report. Other expenditure items attached to the expenditure being rejected do not appear on the report. The report specifies rejection reasons only for transactions with invalid data. The rest of the expenditures within the batch interface to Oracle Projects. The following tables demonstrate these concepts.

> **Note:** The transaction import validation logic is different when you run the process PRC: Interface Supplier Costs to import transactions from Oracle Purchasing and Oracle Payables. The processes uses predefined supplier cost transaction sources to import expenditure items and it rejects only the expenditure items that fail validation. The process imports the valid expenditure items in the expenditure. You can use the

Review Transactions window to change the date for a rejected expenditure item. Oracle Projects picks up the revised date for the rejected transaction the next time that you run the process PRC: Interface Supplier Costs.

Examples of Transaction Exceptions

The following table shows three transactions before Transaction Import:

Transaction	Status	Reason	Expenditure ID
1	P	[blank]	[blank]
2	P	[blank]	[blank]
3	P	[blank]	[blank]

The following table shows the same three transactions after Transaction Import. Only Transaction 1 is shown in the exception report.

Transaction	Status	Reason	Expenditure ID
1	P	INVALID PROJECT	1009
2	P	[blank]	1009
3	P	[blank]	1009

There are three methods you can use to view rejected transactions:

- Use the Review Transactions window

  You can use the Review Transactions window to search for rejected transactions by transaction source or batch name. See: To view rejected transactions, page 13-56.

- Use SQL*Plus

  You can use SQL*Plus to identify the records that have been rejected by selecting those rows with a TRANSACTION_STATUS_CODE of R and selecting the rejection reason for each rejected record from the TRANSACTION_REJECTION_CODE column.

- Review an Oracle Projects report

The Transaction Import Exception Report shows you all of the transactions that were rejected during the Transaction Import process. For each rejected transaction, this report displays the key field values of the transaction in the interface table. It also displays the rejection reason code that identifies the cause of the transaction's rejection. See: Transaction Import Report, *Oracle Projects Fundamentals*.

To view rejected transactions:

1. In the Navigator window, choose Expenditures > Transaction Import > Review Transactions.
2. Optionally enter the transaction source or the name of the expenditure batch containing the failed transaction(s).

   If you do not enter any search criteria, Oracle Projects will retrieve all rejected transactions, sorted by transaction source and batch name.
3. Choose Find.

Review Transactions Window: Currency-Related Fields

The Review Transactions window is a folder-type window. Many of the currency fields are not displayed in the default folder. You may want to create folders that display the fields you need, for the types of entries you need to make.

For information about folder forms see: Administering Folders, *Oracle Applications System Administrator's Guide*.

Review Transactions Window: Expenditure Item Dates for Supplier Costs

The process PRC: Interface Supplier Costs validates expenditure item dates for supplier costs that you interface from Oracle Purchasing and Oracle Payables. If the expenditure item date for an expenditure item fails validation, then the process rejects the transaction and leaves it in the Oracle Projects interface table. You must either change the date setup in Oracle Projects or change the date for the expenditure item. You can use the Review Transactions window to change the date for a rejected expenditure item. Oracle Projects picks up the revised date for the rejected transaction the next time that you run the process PRC: Interface Supplier Costs.

To update the expenditure item date in the Review Transactions window, the *Allow Interface Modifications* option must be enabled for the transaction source. See: Transaction Sources, *Oracle Projects Implementation Guide*.

Correcting Rejected Transactions within Oracle Projects

If you need to make changes to the source information because of invalid data, you need to delete the rejected rows from the interface table, correct the rejected transactions in the feeder system, and reload them from the feeder system. You can also correct the transaction in the interface table using the Review Transactions window. Oracle Projects automatically updates the status of corrected items and all other transactions in the

same expenditure to P (Pending).

The original and updated values for corrected transactions are stored in the audit table PA_TXN_INTERFACE_AUDIT_ALL.

To correct and resubmit rejected transactions:

1. After you use the Review Transactions window to query your rejected transactions, make the changes indicated by the transaction rejection reasons. Oracle Projects validates each transaction and displays any errors before proceeding to the next transaction. Acknowledge each error message by choosing OK if you want to save the transaction with the errors, or choose Cancel and correct the error.

2. Save your work.

3. Choose Import to re-import all the records with a status of Pending for this transaction source and batch. Oracle Projects will validate the transactions online.

You can also use the Review Transactions window to create one or more new transactions without loading them from the feeder system. This window was designed to expedite minor additions to expenditure batches, primarily for testing purposes.

To create new transactions:

1. In the Review Transactions window, choose Edit > New Record.

2. Enter transaction details for the new transaction. The information you must enter depends on the transaction source details, just as when you populate the Transaction Import interface table..

3. Save your work.

4. Choose Import to start the Transaction Import process.

Correcting Rejected Transactions Using SQL*Plus

You can alternately update the rejected transactions in the interface table using SQL*Plus. Then update the TRANSACTION_ STATUS_CODE column to set the value to P so Transaction Import selects the items the next time you run it. When you resubmit updated transactions for processing, all validation is performed again.

Example: Correcting a Rejected Transaction

Let's walk through an example of the steps you take to correct a rejected transaction using the rejected transaction in the Examples of Transaction Exceptions, page 13-55 as our sample data.

1. Correct the invalid data for Transaction 1.

The validation process rejected Transaction 1 because the project you are charging is invalid. Using SQL*Plus, you update the project number of the transaction to a valid project number.

1. Run Transaction Import

Now that you have corrected the rejected expenditure item, and the status of all expenditure items within the rejected expenditure is updated, you can run Transaction Import to successfully import the updated transactions.

Auditing Updates in the Interface Table

You can update rejected and pending transactions in the interface table using the Review Transactions window or SQL*Plus. Whenever you update a transaction, the original and revised transactions are stored in the PA_TXN_INTERFACE_AUDIT_ALL table. Each transaction is uniquely identified by:

- The combination of the transaction source and original system reference
- The transaction interface ID (if the transaction source allows duplicate system references)

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