



Project Partners LLC

Whitepaper

Oracle Projects – Client Extensions

Unlock the Power of Oracle Projects

(Release 11.5.10 Patchset M)

By Randal B. Martin

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Summary

One of the unique features of Oracle Projects is Client Extensions. Client Extensions provide customers the ability to extend the features of the base application to meet a diverse set of business requirements. In this paper, you will be introduced to each of the client extensions and some specific examples of how they have solved real world issues. This paper has been written based on release 11i of Oracle Projects. However, there are a number of these extensions that are available in releases 10.7 and 11 of Oracle Projects.

Client Extensions: Fact or Fiction?

Fiction: Client Extensions are customizations.

Client Extensions are *not* customizations. They are like open interfaces (APIs) that are supported by Oracle. Modifying or using an extension is not modifying any base code (Forms, Reports or processes) from Oracle. Client Extensions are no more of a customization than Descriptive Flexfields or writing your own reports.

Fiction: If you use Client Extensions, Oracle will not support your implementation.

Client Extensions *are* Oracle provided and supported. If you do have an issue with a process that uses an extension, Oracle Support may ask for your extension code or ask you to test without the extension activated to narrow where the problem is happening.

Fact: Client Extensions require PL/SQL programming to use.

Using Client Extensions generally requires about the same level of PL/SQL knowledge that would be required to write a report. As with any technical activity the most important success factor is having well defined functional requirements. It always helps to have technical staff that has some understanding of functional processes.

Summary of Client Extensions by Category

Listed below are each of the client extensions categorized according to the area of Projects they relate and a brief description of their purpose.

Budget Related

Budget Calculation – You can define calculations to automatically populate the Raw Cost, Burdened Cost or Revenue fields.

Budget Verification – Allows you to define rules for validating your budget before the status is changed (from Working to Submitted, from Submitted to Baselined).

Budget Workflow – You can customize the routing of budgets for approval or to determine under what circumstances workflow is used during a budget status change.

Revenue and Invoicing

AR Transaction Type – Allows you to define the AR Transaction Type that will be used when an invoice is interfaced to Receivables.

Automatic Invoice Approval/Release – This extension is called during the Generate Draft Invoice process. With it you can define circumstances under which an invoice can be automatically approved and/or released. It can also be used to perform other actions that you wish to happen during invoice generation not involving the calculation of bill amounts.

Billing Cycle – You can define the rules to determine the next billing date for a project.

Billing Extension – A very powerful extension that can be used to perform a wide range of duties during either the Generate Draft Invoice and/or Generate Draft Revenue processes. This can include putting expenditure items on hold, creating billing events etc.

Labor Billing – Allows you to define the labor billing amount or an additive billing amount (markup) on labor transactions. This extension is called for every labor transaction during revenue generation for projects using a WORK based distribution rule.

Non Labor Billing – Like the Labor Billing extension, this extension is called for every non labor transaction during revenue generation for projects using a WORK based

distribution rule. With it you can supplement or replace the use of bill rate/burden schedules for deriving bill amounts for non labor transactions.

Percent Complete Billing – Oracle has predefined this using the Billing Extension. This billing extension is used for Projects using the Cost based distribution rule.

Cost Accrual Identification – This extension can be used to identify cross-charge projects that use cost accrual during revenue generation.

Cost Accrual Billing – Cost Accrual Billing like Percent Complete Billing makes use of Oracles Billing extension. Cost Accrual functionality in Oracle Projects allows you to create accounting entries to relieve cost during revenue generation. The Cost Accrual Billing extension allows you to customize the calculation and circumstances under which these entries are created.

Receivables Installation Override – Allows you to utilize a non-Oracle receivables system and yet take advantage of client information in Oracle Receivables for reference by Projects. This extension is called during the PRC: Interface Invoices to Receivables process, and allows the invoice status to be changed to accepted without actual interface to Oracle Receivables. You, of course, must provide the interface to your non Oracle Receivables system.

Output Tax Code – Allows you to automatically define the tax code to be assigned to each line of an invoice during draft invoice generation.

Funding Revaluation Factor – Use to apply a funding revaluation factor to the funding backlog amount. 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. This functionality is relevant where you have agreements denominated in a currency other than your functional currency.

Retention Billing – Allows you to utilize your company's business rules for the timing of billing withheld amounts.

Costing and Expenditures

Allocation – There are a number of procedures within this extension to permit the determination of the Source, Target and/or Offset projects and tasks, the Basis of the allocation, dependencies of the allocation and the ability to provide descriptive flexfield values for the transactions created by the allocation.

Labor Costing – This extension is called during the Distribute Labor Cost process and allows you to define the method for automatically calculating the raw cost for your labor transactions.

Labor Transaction – This extension is also called during the Distribute Labor Cost process. It allows you to create additional related transaction(s) for each original labor transaction.

Overtime Calculation – Customize the way Oracle determines the overtime cost. Oracle calls this extension during Distribute Labor Cost process for labor transactions of the expenditure class Overtime.

Burden Costing – Allows you to override the burden schedule and revision id to be applied to a transaction. This extension is called during cost distribution processes.

Commitment Changes – If you are utilizing commitments in your project status inquiry and if you have commitments from non-Oracle sources you will need to utilize this extension to assist Oracle in determining the status of your commitments.

Transaction Control – The transaction control extension is called anytime a transaction is entered against an Oracle Project from any Oracle source (Payables, Projects, Internet Time, Internet Expense etc.). This extension allows you to define the circumstances under which a transaction is valid or not. This is particularly useful when you have rules that apply to many or all projects.

Summary Validation – The summary validation extension is called when submitting an online timecard. Internet Time (formerly Self-Service Time) calls this extension when the user submits the timecard. With this extension you can provide custom logic to determine whether the timecard is valid and can be submitted.

Autoapproval – Used to define conditions under which expense reports and timecards are approved automatically.

Transaction Import Pre/Post – Used to add procedures that run before and/or after the Transaction Import process. In the transaction source screen you associate a package.procedure to a transaction source.

Pre/Post Import Internet Time – Oracle has seeded a package that is called both before and after import of the transaction source Oracle Internet Time. You can modify this package.procedure to provide additional validation to be executed prior or after import of Internet Time approved self-service timecards.

Multi-Org and Cross Charge

Provider and Receiver Organizations Override – You can use this extension to enforce cross-charge rules at a higher level in the organization hierarchy than the level at which you assign resources and projects.

Cross-Charge Processing Method Override – By default the cross-charge method is determined at the operating unit level. This extension allows you to override the method of cross-charge treatment.

Transfer Price Determination – This extension allows you to calculate a transfer price according to your business rules. If you do calculate a transfer price, Oracle will use your price and not perform additional calculations.

Transfer Price Override – This extension is similar to the TP Determination extension except that prior to calling this extension Oracle calculates the transfer price of the transaction according to your setups. You then have the opportunity to override or keep the Oracle calculation.

Transfer Price Currency Conversion – This extension allows you to override the exchange rate used by Oracle when converting the transfer price into the functional currency of the receiving operating unit.

Internal Payables Invoice Attributes Override – Can be used to override the Expenditure Organization and/or Expenditure Type of internal payables invoices created as part of Intercompany or Inter-Project Billing.

Capital Projects

Asset Assignment – Allows you to determine which Asset that a transaction should be assigned to if the transaction is determined to be unassigned by Oracle.

Asset Cost Allocation Basis – Can be used to define your own allocation bases for allocating unassigned and common costs across multiple project assets.

Asset Lines Processing – Can be used to automatically create project assets (capital assets and retirement adjustment assets) and asset assignments prior to generating asset lines when you submit the PRC: Generate Asset Lines process.

Capital Event Processing - Can be used to automatically create project assets (capital assets and retirement adjustment assets) and asset assignments prior to creating capital events when you submit the PRC: Create Periodic Capital Events process.

CIP Account Override – Can be used to override the CIP account associated with an asset line and specify a different account for posting CIP clearing amounts.

CIP Grouping – Define a unique method that your company uses to specify how expenditure lines are grouped to form asset lines.

Depreciation Account Override – Define logic for deriving the depreciation expense account when you define an asset or interface asset lines to Oracle Assets.

Capitalized Interest – Can be used to customize the calculation and recording of capitalized interest (e.g. Interest during construction).

Projects

Archive Project Validation – Can be used to define additional business rules for validating the eligibility of a project for archive/purge.

Project and Task Date – This extension can be used to provide alternative project/task start and completion dates for projects being created/updated from external systems.

Project Verification – This extension is called whenever the status of a Project is changed. With this extension you can perform additional validation to prevent invalid status changes. This extension can also be used to determine whether to initiate workflow for a status change.

Project Workflow – Customize the process to determine the workflow approver of a project status change.

Verify Organization Change – This extension is called whenever a Project or Task owning organization is changed. You can use this extension to perform additional validation and prevent erroneous changes.

Resource Management

Assignment Approval Changes – Provides control over the approval process for changes in the duration or work type of an assignment.

Assignment Approval Notification – Customize the list of default contacts used by the assignment approval workflow.

Candidate Notification Workflow – The New Candidate and Candidate Assigned workflow processes call this extension which allows you to customize the list of notification recipients.

Project Management

Workplan Workflow – Customize the workflow processes for submitting, approving and publishing a workplan.

Control Item Document Numbering – Create your own logic for numbering Issues and Change documents when automatic numbering is enabled for a control item type.

Issue and Change Workflow – Customize the workflow processes for submitting and approving issues and change documents.

Project Status Report Workflow - Customize the workflow processes for submitting, approving and publishing a project status report.

Project Status Inquiry – This extension can be used to customize the calculation of any one of the user-defined columns in project status inquiry. This includes the ability to include non-Oracle sources of data in your project status inquiry such as project management system information.

Other

Descriptive Flexfield Mapping – This extension allows to specify which the mapping of Projects DFF attributes to Payables DFF attributes and vice versa when transactions are interfaced between Payables and Projects.

Project Security – This extension provide broad ability to customize the viewing and update security surrounding many functions within Oracle Projects such as the updating of project information and viewing of labor costs.

Archive Custom Tables – This extension is called as part of the standard purge process. With this extension you can implement and integrate your own archiving/purge functionality for projects related custom tables you have created.

Business Requirements Solved Using Client Extensions

In this section we examine a number of business requirements that Project Partners has solved or made easier to enforce through the use of Client Extensions.

Billing Extension for Fixed Fee plus Reimbursables – In this billing method, labor is billed using Events (Fixed Fee) and Non Labor is billed as incurred. In order to accomplish this without the use of an extension you would have to use WORK/EVENT distribution rule and enter all billing as an event. However, the client wanted to take advantage of WORK based billing for non labor. To accomplish this, a Billing Extension (Pre-Processing) was defined to put all labor items on bill hold prior to the generation of draft invoices. The project could then be set to WORK/WORK distribution rule so that non-labor items were billed using WORK based billing.

The other important use of this extension is to support projects with a combination of Fixed Price and Time & Materials arrangements. The project can be setup with the WORK/WORK distribution rule. This extension can then simply be assigned to those tasks that you wish to bill using events.

Labor Billing Extension for Project/Task Level Bill Rates – Without extensions bill rates for labor are defined either by employee or job on a bill rate schedule. The client, however, utilized a single bill rate at the Project or Task level. By using the Labor Billing Extension and a descriptive flexfield on the Project and Task to hold the bill rate, the maintenance of bill rate overrides was eliminated.

Billing at Percent Complete Milestones – The requirement was to automatically invoice an agreed amount upon achieving certain percent complete milestones. The standard percent complete screen within projects was used to capture actual percent complete (not financial percent complete) information. This Billing extension then checks the percent complete information and automatically creates billing events for the pre-determined amounts during mass invoice generation.

Labor Costing using Actual Labor Rates – The requirement was to calculate actual labor cost by employee using salary information from Oracle Human Resources. During Labor Distribution the costing extension retrieves the actual base salary information for the employee and determines the base labor rate per hour as (Weekly Salary / Total Hours). This enabled one client to better meet DCAA requirements for their government contracts. Without this extension you would need to maintain actual labor rates by employee in Oracle Projects labor rate detail screen. In addition, the extension is able to calculate the actual labor rate per hour even as total hours per week change for exempt personnel. For example, a \$1000/wk exempt salaried employee may work 40 hours one week and 45 hours the next week. This labor costing extension will cost 40 hours X 25 = \$1000 for week one and 45 hours X 22.2222 = \$1000 for week two.

Labor Costing using Average Actual Labor Rate per Job - The previous extension was also used to calculate the average labor rate per hour by Job. For example, the salary information for all Senior Engineers is retrieved and averaged to compute an average actual labor rate.

Summary Validation extension to validate hours on timecard – The client uses Oracle Internet Time and needed to ensure that employees did not over or under report regular hours. The extension checks the standard work week for the employee in Oracle Human Resources. The total Regular Hours (excluding overtime) on the timecard are compared to the standard work week for the employee and an exception is raised if there is a difference.

Project Status Inquiry – The PSI Extension can be used to show information from many sources. Some examples of requirements met using this extension:

- Total Amount Billed on the Project
- Actual Percent Complete information (not financial)
- Total Amount Collected (in receivables) on the Project
- WIP Balance (Unrelieved Cost in Inventory)

Bill when Paid – The requirement is to bill the customer for supplier costs only once they have been paid. The Billing Extension solves this requirement by putting expenditure items on hold that have not been paid by checking the payment status in Oracle Payables. Once the item has been paid the extension removes the billing hold.

Labor Billing Extension for Activity Code Override Rates – The labor billing extension was used in conjunction with the creation of dummy jobs in Oracle HR to permit the entry and maintenance activity-based override rates. The standard Job Bill Rate Overrides window is used for the entry and maintenance of these overrides.

Labor Costing for Prevailing Wages – The client needed to comply with California Prevailing Wage regulations. The labor costing extension was used in order to correctly cost labor for projects and payroll purposes. The labor costing extension costed labor charged to a prevailing wage project at the highest of three rates:

- The employee's hourly rate (from Oracle Human Resources)
- The Basic Hourly Rate for the prevailing wage work classification
- The Wage Determination Rate for the prevailing wage work classification, adjusted for fringe benefits.

Transaction Control Extension – A client had the following requirements that were addressed through a transaction control extension:

- Allow only certain users to perform transfers of expenditure items from direct to indirect projects

- Prevent labor charging to projects with a certain project status, but still permit nonlabor to be charged (for trailing supplier invoices).
- For Government Cost Plus contracts (identified using the Public Sector flag on the project) unallowable costs were automatically marked as non-billable. Unallowable costs were determined using a descriptive flexfield on the expenditure type.
- Validate overtime expenditure types – Employees were restricted in their use of overtime expenditure types on timecards based on their eligibility captured in Oracle HR.
- Enforce Expenditure/Task Organization matching – Employees were only allowed to charge tasks owned by their organization. The transaction control enforced this by comparing the employee's assigned organization to the task owning organization.

Cross Charge Processing Method Override Extension – A client who was transferring cross charge revenue based upon cost wanted to prevent cross charge transactions from being created on non-billable expenditure items.

Cross Charge Provider and Receiver Organization Override Extension – The client used higher-level organizations as the nonlabor resource organization so this extension was used to set the provider organization equal to the expenditure organization (instead of the nonlabor resource organization).

Transfer Price Override Extension – The client wished to have the transfer price on certain expenditure types to be 85% of revenue, and 100% of revenue on all other expenditure types.

Provision For Loss Extension – Provision for Loss is calculated for Fixed Price projects by comparing future revenues less future costs. This extension calculates provision events for a corporate reporting and divisional reporting viewpoint. Future revenues equal the project revenue budget less all inception to date revenues against the project. Future costs equal cost budget lines less adjustments for SG&A costs and an average burden multiplier.

Throughout the life of the project the provision is adjusted based on the calculated profit or loss position. An extension also allocates the provisions based on the same type of calculation at the Task level. All allocating events to Task organizations are summed to create a 'negative' or contra event for the project org.

Work In Process Extension – By default all costs are expensed, however, this extension calculates WIP and creates the appropriate accounting entry using events to relieve or

add to WIP. This extension like Oracle's Cost Accrual extension makes use of the Billing Extension's ability to create automatic events.

Revenue Allocation Extension – This extension creates revenue events to re-allocate revenue among departments based on two different methods, Cost Coverage or Task Budget. Cost Coverage results in revenue being proportionately allocated to each Expenditure Organization. Task Special allocates revenue to each task based on the budgeted task revenue. Since events cannot be entered at lower level tasks, the extension creates all events at the Project level with the Task identified on a descriptive flexfield of the event for reporting and calculation purposes.

Internal Markup, Revenue and Invoice Extension – This extension is designed for 'Provider' projects and calculates additional mark up fees that have been agreed upon by the contract. For T&M agreements, Expenditure Items are billed at burdened cost and in addition labor and non-labor have specific mark up's applied. Labor is calculated by using a custom rate table per organization and job category. Non-labor items are applied a general mark up per agreement. For Fixed Price contracts, the mark up is calculated as a percentage of overall estimated profit multiplied by total project costs. Internal Mark Up's are not created until the project has reached a minimum of percent spent of the overall cost budget. The percent spent is held via profile options and assigned as a class category to the project.

Cost Plus Fixed Fee – Cost Plus Fixed Fee is a method of billing common in the Aerospace, Defense and Government Contracting industries. The fee portion of the invoice is generally based on a percentage of cost. Capturing the fee percentage and the eligibility for the timing of the fee billing are some of the requirements involved in CPFF billing. Another is Retainage. Typically a percentage of the fee is not billable until the contract and all post-contract audits are completed.

A Billing Extension was used with other components to handle all aspects of the CPFF requirements including Fee Calculation and Retainage handling.

Progress Billing – Another method of billing common in the Aerospace & Defense industries is Progress Billing. It is fundamentally designed to reimburse contractors for a portion of their incurred costs prior to the delivery of the goods or services being contracted for. Some of common requirements of Progress Billing may be:

- Withhold billing on items that have not yet been paid for. (i.e., Payables status).
- Liquidation of progress billed amounts for DD250 invoices when the product is delivered.

A Billing Extension was used to handle the calculation of the Progress Billing amount less withholds and to handle the creation of liquidation events for DD250 invoices.

Project Verification Extension - This extension was used by one client to restrict Projects from being closed until billing and revenue were fully completed. For another client this extension was used to verify that all necessary setup information was in place prior to project approval and help manage revenue accruals during the early phase of the project. In this case projects were initially setup to a Contract Pending status. During this status the billing rates were not definitized, however, charging was permitted. Billing extension logic was such that during this status that labor revenue was only accrued at a multiplier of 1.3. Upon finalization of bill rates the project status was updated to Approved and the Project Verification extension marked existing items to have revenue recalculated and automatically submitted revenue generation for the project which recalculated revenue to the final rates. Only once Approved was Billing permitted as enforced by the allow billing attribute of the Project Status.

Billing Retention Extension – This extension was used to check the project status to determine eligibility for billing retention withheld. Once the project status of the project was changed to ‘Retention Billable’ this extension recognized the eligibility of the project to bill previously withheld retention.

Transaction Import Pre-Processing Extension – This extension was used for the transaction source used to enter Project Journals. The extension checked to ensure that Debits equaled Credits (i.e. that the net effect of the “Journal” was zero). Without this extension miscellaneous entries can be recorded against a project and the credit will hit the default account defined in the Miscellaneous Clearing autoaccounting rule.

Invoice Autoapprove / Release Extension – Custom invoice numbering was implemented using this extension.

About the Author: Randal B. Martin is a Managing Principal Consultant with Project Partners, LLC. Mr. Martin has worked with and implemented Oracle Financials and Oracle Projects for over a decade, and has extensive experience using Client Extensions in various industries. Mr. Martin is a CPA and a former Accounting Manager.

About the Company: Project Partners, LLC is a privately held firm headquartered in Half Moon Bay, California, offering expert consulting services and software products to project-driven firms. Since 1997 over 125 firms around the world have selected Project Partners for expert services and products that extend the Oracle Applications solution, to increase productivity and reduce operating costs. An Oracle Certified Partner, Project Partners has executed global projects for clients involving tens of thousands of projects, thousands of users, multiple languages and currencies. Project Partners’ OP3™ product integrates Primavera and Oracle Enterprise Project Management in one week or less. Project Information Center™ leverages the information that is stored in disparate corporate databases, ERP and project scheduling systems to create complex project and financial reports at various levels of flexible hierarchies. Project Loader integrates third party and legacy systems with Oracle Projects, for one-time conversions as well as on-going seamless data sharing. More information about Project Partners can be found at www.ProjectP.com.