

# **Oracle Public Sector Revenue Management Analytics**

Implementation Guide

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# Chapter 1

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## Preface

The *Oracle Public Sector Revenue Management Analytics Implementation Guide* describes best practices for implementing a data warehouse based on Oracle Public Sector Revenue Management Analytics.

### Audience

This document is intended for business analysts, data modelers, data warehouse administrators, IT staff, and ETL developers who implement Oracle Public Sector Revenue Management Analytics.

### Documentation and Related Resources

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Oracle Public Sector Revenue Management Analytics Documentation Set

The Oracle Public Sector Revenue Management Analytics documentation set includes the following documents:

- *Oracle Public Sector Revenue Management Analytics Release Notes*
- *Oracle Public Sector Revenue Management Analytics Quick Install Guide*
- *Oracle Public Sector Revenue Management Analytics Installation Guide*
- *Oracle Public Sector Revenue Management Analytics Implementation Guide*
- *Oracle Public Sector Revenue Management Analytics Reference Guides*
  - *Introduction to Reference Materials*
  - *ETL Reference Guide*
  - *Data Mining Reference Guide*
  - *Data Model Reference Guide*
  - *Metrics Reference Guide*

- *Reporting Reference Guide*

**Note:** All Reference Guides are restricted to Oracle Public Sector Revenue Management Analytics customers. In order to download these documents, please contact Oracle Support to request access to bug number 16876111.

Oracle Technology Network

Visit the Oracle Technology Network (OTN) to access demos, whitepapers, Oracle By Example (OBE) tutorials, updated Oracle documentation, and other collateral.

*Registering on OTN*

You must register online before using OTN, Registration is free and can be done at [www.oracle.com/technetwork/index.html](http://www.oracle.com/technetwork/index.html)

*Oracle Documentation on OTN*

The Oracle Documentation site on OTN provides access to Oracle documentation. After you have a user name and password for OTN, you can go directly to the documentation section of the OTN Web site at <http://www.oracle.com/technetwork/indexes/documentation/index.html>.

Oracle Support

Oracle customers have access to electronic support through My Oracle Support.

## Document Conventions

The following text conventions are used in this document:

**Table 1: Documentation Conventions**

<b>Convention</b>	<b>Meaning</b>
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

# Chapter 2

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## Introduction to Oracle Public Sector Revenue Management Analytics Customization

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This section provides an introduction to customizing Oracle Public Sector Revenue Management Analytics.

### What is Oracle Public Sector Revenue Management Analytics?

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Oracle Public Sector Revenue Management Analytics is a standards-based Enterprise Data Warehouse pre-built solution that addresses the operational and predictive analytical needs of public sector revenue management authorities.

#### Overview

The Oracle Public Sector Revenue Management Analytics tax and revenue management data warehousing solution enables tax authorities and public sector agencies to realize the power of insight more quickly. Oracle Public Sector Revenue Management Analytics reduces costs for both immediate and on-going operations by leveraging out-of-box Oracle-based Data Warehouse and Business Intelligence solutions, making world-class database and business intelligence technology solutions available with a taxation-specific data model.

Using Oracle Public Sector Revenue Management Analytics, you can jump-start design and implementation and quickly achieve a positive ROI for your data warehousing and business intelligence project with a predictable implementation effort. The pre-built content includes a foundational Oracle Public Sector Revenue Management Data Model, Intra-ETL for data movement within the Oracle Public Sector Revenue Management Data Model, reports, dashboards, metrics, and key performance indicators.

Oracle Public Sector Revenue Management Analytics provides much of the data modeling work that you must do for a tax or public sector business intelligence solution. The Oracle Public Sector Revenue Management Analytics logical and physical data models were designed following best practices generally for public sector agencies and specifically for tax authorities.

# Oracle Public Sector Revenue Management Analytics Components

Oracle Public Sector Revenue Management Analytics includes the following components:

- Oracle Public Sector Revenue Management Data Model. Based on Oracle's leading data warehousing technology and reference architecture, the Oracle Public Sector Revenue Management Data Model provides a schema that contains a foundation layer and an analytical layer.
  - Foundation Layer: the Foundation Layer is a third normal for (3NF) entity-object standards-based model that provides an integrated basis for business information with fully defined entities and relationships.
  - Analytical Layer: the Analytical Layer includes tables to support operational and predictive analytics.
- Oracle Data Integrator (ODI) Intra-ETL packages to extract, transform, and load data from the foundation layer tables to the derived and aggregate tables in the analytical layer.
- Reports, dashboards, metrics, key performance indicators developed using Oracle Business Intelligence Suite Enterprise Edition.
- Data mining schema.

See the *Oracle Public Sector Revenue Management Analytics Reference Guides* and the *Oracle Public Sector Revenue Management Analytics Installation Guide* for additional information on the components.

## Oracle Products in Oracle Public Sector Revenue Management Analytics

Several Oracle technologies are involved in building the infrastructure for Oracle Public Sector Revenue Management Analytics.

- [Oracle Database](#)
- [Enterprise Edition Oracle Data Integrator](#)
- [Oracle Development Tools](#)
- [Oracle Business Intelligence Suite Enterprise Edition Presentation Tools](#)
- [Oracle Data Mining](#)

### Oracle Database

Oracle Public Sector Revenue Management Analytics uses a complete Oracle technical stack.

### Oracle Data Integrator

Oracle Data Integrator is a comprehensive data integration platform that covers all data integration requirements: from high-volume/high-performance batch loads, to event-driven, trickle-feed integration processes, to SOA-enabled data services. Oracle Data Integrator is the technology used for Intra-ETL within the Oracle Public Sector Revenue Management Data Model.

## Oracle Development Tools

You can use the following Oracle tools to customize the predefined physical models provided with Oracle Public Sector Revenue Management Data Model:

**Table 2: Oracle Development Tools Used with Oracle Public Sector Revenue Management Analytics**

Name	Use
SQL Developer or SQL*Plus	To modify, customize, and extend database objects

## Oracle Business Intelligence Suite Enterprise Edition Presentation Tools

Oracle Business Intelligence Suite Enterprise Edition is a comprehensive suite of enterprise BI products that delivers a full range of analysis and reporting capabilities. You can use Oracle Business Intelligence Suite Enterprise Edition Analysis and Dashboard presentation tools to create your own measure, KPI, reports and dashboards.

## Oracle Data Mining

Oracle Data Mining provides powerful data mining functionality as native SQL functions within the Oracle Database. Oracle Data Mining enables users to discover new insights hidden in data and to leverage investments in Oracle Database technology. With Oracle Data Mining, you can build and apply predictive models that help you target your best customers, develop detailed customer profiles, and find and prevent fraud. Oracle Data Mining, a component of the Oracle Advanced Analytics Option, helps companies better "compete on analytics." Oracle Data Mining provides a collection of in-database data mining algorithms that solve a wide range of business problems. The sample data mining model that is included with Oracle Public Sector Revenue Management Analytics utilizes the Oracle Data Mining technology. Oracle Data Mining is an optional component of the Oracle Public Sector Revenue Management Analytics infrastructure.

## Customizing Oracle Public Sector Revenue Management Analytics

Although Oracle Public Sector Revenue Management Analytics was designed following best practices for public sector revenue management authorities, usually the model requires some customization to meet your business needs. The reasons that you might customize Oracle Public Sector Revenue Management Analytics include:

- You business does not have a business area that is in the Oracle Public Sector Revenue Management Analytics data model.
- Your business has a specific business are that does not exist in the Oracle Public Sector Revenue Management Analytics Data Analytics data model.
- You want to add a new or different business rule.
- You have different presentation requirements.

Oracle Public Sector Revenue Management Analytics does not support custom code developed by customers unless the issues related to customizations can be recreated using Oracle Public Sector Revenue Management Analytics delivered objects.

Before you start, ensure the implementation team has the required knowledge as outlined in the following section.



## Prerequisite Knowledge for Implementers

As outlined in *Oracle Products in Oracle Public Sector Revenue Management Analytics*, Oracle Public Sector Revenue Management Analytics uses much of the Oracle stack. Consequently, to successfully implement Oracle Public Sector Revenue Management Analytics, the implementation team needs:

- Experience performing information and data analysis and data modeling.
  - **Note:** Experience using Oracle SQL Data Modeler, is a plus.
- An understanding of the Oracle technology stack, especially related to data warehouse (database, data warehouse, OLAP, data mining, Oracle Data Integrator, Oracle Business Intelligence Suite Enterprise Edition).
- Hands-on experience using:
  - Oracle Database
  - PL/SQL
  - SQL DDL and DML syntax
  - Oracle Data Integrator
  - Oracle SQL Developer
  - Oracle Business Intelligence Suite Enterprise Edition Administrator, Answers, and Dashboards

# Chapter 3

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## Physical Model Customization

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This section provides general information about customizing the Oracle Public Sector Revenue Management Analytics physical model.

### Conventions When Customizing the Physical Model

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When developing the physical model for Oracle Public Sector Revenue Management Analytics, the conventions outlined below were followed. Continue to follow these conventions as you customize the physical model.

#### General Naming Conventions for Physical Objects

Follow these guidelines for naming physical objects that you define:

- When naming the physical objects follow the naming guidelines for naming objects within an Oracle Database schema. For example:
  - Table and column names must start with a letter, can use only 30 alphanumeric characters or less, cannot contain spaces or some special characters such as "!" and cannot use reserved words.
  - Table names must be unique within a schema that is shared with views and synonyms.
  - Column names must be unique within a table.
- Although it is common to use abbreviations in the physical modeling stage, as much as possible, use names for the physical objects that correspond to the names of the entities in the logical model. Use consistent abbreviations to avoid programmer and user confusion.
- When naming columns, use short names if possible. Short column names reduce the time required for SQL command parsing.
- The OTDM schema delivered with Oracle Public Sector Revenue Management Analytics uses the prefixes and suffixes described in the Naming Conventions section in the *Oracle Public Sector Revenue Management Analytics Data Model Reference Guide*. Use these prefixes and suffixes for any new tables, views, cubes and indexes that you define, and ensure that they are prefixed with **WX**.

**Note:** See: *Oracle Public Sector Revenue Management Analytics Reference Guide* for detailed information about the objects in the default Oracle Public Sector Revenue Management Analytics.

## Common Change Scenarios

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There are several common change scenarios when customizing the foundation layer of the physical data model:

### Additions to Existing Structures

If you identify business areas or processes that are not supported in the default foundation layer of the Oracle Public Sector Revenue Management Analytics physical data model, add new tables and columns. Ensure these are prefixed correctly.

Carefully study the default foundation layer of the physical data model of Oracle Public Sector Revenue Management Analytics (and the underlying logical data model) to avoid building redundant structures when making additions. If these additions add high value to your business value, communicate the additions back to the Oracle Public Sector Revenue Management Analytics Development Team for possible inclusion in future releases of Oracle Public Sector Revenue Management Analytics.

### Changes to Existing Structures

In some situations some structures in the foundation layer of the physical data model of the Oracle Public Sector Revenue Management Analytics may not exactly match the corresponding structures that you use. In this case you can make a copy of the structure prefixing it with **WX** and then make the changes required.

### Deletions of Existing Structures

If there are areas of the model that cannot be matched to any of the business requirements of your legacy systems, it is safer to keep these structures and not populate that part of the warehouse.

Deleting a table in the foundation layer of the physical data model can destroy relationships needed in other parts of the model or by applications based on it. Some tables may not be needed during the initial implementation, but you may want to use these structures at a later time. If this is a possibility, keeping the structures now saves re-work later.

If tables are deleted they will be added back once you perform a product upgrade.

**Note:** The guidelines above apply to both the foundation layer and the access and performance layer included in the OTDM schema.

## Domain Values

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The Oracle Public Sector Revenue Management Data Model uses the concept of domain values to allow customers to utilize their own specific business codes while still taking advantage of out-of-the-box reports and metrics. One or more customer values can be mapped to a single domain value. The domain value, rather than the customer specific value, is then used in conditional logic in the intra ETL and/or reporting layer.

Each of the reference tables in the data model contains a column for the domain value. The column name has the same name as the primary key of the table (the "code"), but prefixed with a **w**.

For example, in the reference table `Taxpayer Type - W_TXPYR_TYP_RN`:

- `TXPYR_TYP_CD` (Taxpayer Type Code) is the primary key of the table. It contains the code used by the users, which has business meaning.

- W\_TXPYR\_TYP\_CD is the domain value of the Taxpayer Type Code. If any of the ETL or reporting logic needs to refer to a specific code, it will use the domain value rather than the Taxpayer Type Code.

In this example, the registration metrics and dashboards are designed to analyze the taxpayer base by the following high-level categories, implemented as domain values:

- INDVL - Individual
- BSNS - Business
- NON\_PFT - Non Profit
- GOVT - Government

The customer-specific values for the highest level of Taxpayer Type must then map to one of the above domain values.

## Registration Domain Values

The following domain values are used in **Registration** for Taxpayer Type:

- INDVL - Individual
- BSNS - Business
- NON\_PFT - Non Profit
- GOVT - Government

**Note:** These values are used for the highest level of the Taxpayer Type (level 1 or parent Taxpayer Type) as defined in the Taxpayer Type Hierarchy table.

## Payments Domain Values

The following domain values are used in the payments metrics and/or dashboards:

### Payment Event Status

- PENDING - This status is used for payment events that have been uploaded and are either in error and/or have not been allocated yet. The purpose of this status is to allow mapping of implementation specific statuses that indicate that the payment event should not be included in metrics. Payment records that have a status whose domain is PENDING will not be extracted in the ETL and will not be included in the metrics, as the assumption is that some validation is still needed for these records.
- SUSPENDED - This status is used for payment events that are valid (tender is valid) but for some reason cannot be allocated to a taxpayer.
- ALLOCATED - This status is used for payment events that have been allocated to a taxpayer. The assumption is that there is no partial allocation. The full payment event amount should be allocated to one or more taxpayers in order for the payment event to be considered ALLOCATED.
- CANCELLED - This status is used for payment events that have been cancelled. This could be due insufficient funds or some issue with the tender.

### Payment Status

- SUSPENDED - This status is used when the payment amount cannot be allocated to a taxpayer and obligation.
- ALLOCATED - This status is used when an amount is allocated to a taxpayer and obligation/s. The assumption is that there is no partial allocation. Once the amount from the payment event is allocated to one or more taxpayer's this amount must be further allocated to obligations.
- CANCELLED - This status is used for payments that have been cancelled. This usually occurs when the allocation is incorrect and the payment amount needs to be allocated to a different taxpayer and/or different obligation(s).

**The following are sample mappings from PSRM status:**

<b>PSRM Payment Status</b>	<b>PSRMA Mapping</b>
<b>Incomplete</b>	Assumption is that the distribution is WIP and these payment records will <i>NOT</i> be extracted to PSRMA. In this scenario a <b>PENDING</b> payment event will be created without a payment record.
<b>Error</b>	Assumption is that the distribution is WIP and these payment records will <i>NOT</i> be extracted to PSRMA. In this scenario a <b>PENDING</b> payment event will be created without a payment record.
<b>Freezable</b>	<p>The recommendation would be to treat these as <b>Incomplete</b>, since no financial transactions have been created and the obligation balance has not been impacted. However, if there is a business need to bring these across, then one of the following options can be chosen:</p> <ul style="list-style-type: none"> <li>• A <b>PENDING</b> payment event will be created without a payment record.</li> <li>• A <b>PENDING</b> payment event will be created with an <b>ALLOCATED</b> payment record. A payment allocation record will also be created but no financial events.</li> </ul>
<b>Frozen</b>	<b>ALLOCATED</b> or <b>SUSPENDED</b> depending on whether the payment was allocated to a taxpayer's obligation <i>OR</i> suspense obligation.
<b>Cancelled</b>	<b>CANCELLED</b>

**Note:** The Payment Event Status and Payment Status codes are set up in the Entity Status Table (W\_ENTITY\_STAT\_RN).

**Payment Channel Type**

- **SELF-SERVICE** - Used to describe a payment channel that uses online delivery method to accept the payment.
- **PHONE** - Used to describe a payment channel that uses phone to accept the payment. This is also known as IVR.
- **LOCK-BOX** - Used to describe a payment channel that accepts checks in the mail. This can be internal at the revenue agency or third party processing the checks on behalf of the revenue agency.
- **BANK** - Used to describe a payment channel that is a bank which accepts payments on behalf of the revenue agency. The payment files are sent to the revenue agency with details of the specific payments.
- **POST-OFFICE** - Used to describe a payment channel that is a post office which accepts payments on behalf of the revenue agency.
- **CASHIER** - Used to describe payments paid physically at the revenue agency offices.
- **RETAIL** - Used to describe a payment channel that is a retail store which accepts payments on behalf of the revenue agency.

# Chapter 4

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## Intra-ETL Customization

Oracle Public Sector Revenue Management Analytics supports the use of ETL tools such as Oracle Data Integrator to define the workflow to execute the intra-ETL process. You can, of course, write your own intra-ETL. However, an intra-ETL component is delivered with Oracle Public Sector Revenue Management Analytics. This process flow is described in the ETL Reference Guide.

Follow these guidelines for customizing the intra-ETL:

- Do not make any changes to the packages or interfaces included as part of Oracle Public Sector Revenue Management Analytics. Any changes made to product code may be lost during an upgrade and cannot be supported. If you need to make changes, create a copy of the interface and then make changes.
- New interfaces and packages need to reside in a designated folder/s for customized code. Do not add any objects under product folders. This will ensure your code is not impacted during an upgrade.
- ODI repository IDs **001** to **500** and **999** are reserved for product development. Custom code must be created using repository ID in the range of **501** to **998**.

# Chapter 5

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## Reporting Layer Customization

Dashboards and reports are delivered with Oracle Public Sector Revenue Management Analytics. These were developed using Oracle Business Intelligence Suite Enterprise Edition which is a comprehensive suite of enterprise business intelligence products that delivers a full range of analysis and reporting capabilities. Thus, the reports also illustrate the ease with which you can use Oracle Business Intelligence Suite Enterprise Edition Answers and Dashboard presentation tools to create useful reports. See the *Oracle Public Sector Revenue Management Analytics Reporting Reference Guide* for detailed information on the included reports.

You can use Oracle Business Intelligence Suite Enterprise Edition Answers and Dashboard presentation tools to create your own dashboards and reports. Changes to product reports or metrics are not supported. If you see a report or metric that needs to be changed to suit your business requirements, make a copy of this report/metric and then apply your changes.

New reports and/or dashboards should be created in a designated folder/s for customized code. Do not add any objects under product folders. This will ensure your code is not impacted during an upgrade.