Oracle Financial Services Accounting Foundation Cloud Service

Data Catalog



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Oracle Financial Services Accounting Foundation Cloud Service Data Catalog, Release 26D

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Revision History

Table 1-1 Document Control

Release and Version Number	Revision Date	Change Log
R26D, V1.0	November 2026	Documented the following: • Added Business terms Validation in Create Dimension section. • Added a note on Single action for Create Dimension, Extend Dimension and Extend Fact sections.
R26C, V1.0	August 2026	Documented the following: • Extend Business Terms • Create a Dimension Entity • Extend Dimension Entity • Publish an Action • Incremental DQ updates in the Use and Execute the Source Data Quality Check Process. • Partition creation for custom entities in the Publish Change Request Process Workflow.
R 26B, V1.0	May 2026	Documented the following: • Added details on Critical data Elements in the Create Business Terms and Extend Business Terms. • Added Critical Data Elements Assignment.

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Data Catalog Overview

Data Catalog is the logical representation of the underlying Data Model, which is contextualized by the Metadata to enable a better understanding of the Data Model and the enterprise-wide data. For example, understanding the End of Period Book Balance in the context of Loans and Securities may require two definitions of the term in discovering. A further analysis of the Metadata helps discovering, the sources, current business uses of the element, validation checks, and any privacy aspects.

The Data Catalog comprises of elements called Business Terms supporting business needs of the Banking and Financial Services Industry across the Finance, Risk, and Regulatory Compliance Functions. Data Catalog includes sourced, calculated, and master elements. Elements that require conformation to the standards will have a list of expected values. A combination of Business Terms and Entities form the underlying Data Model. The search capability allows you to explore data by different dimensions.

The Data Catalog helps you understand the business relevance of an Element and the associated Data Definition, grain through Entities and Subject Areas. You can group the Data Catalog by Subject Area and this subset is narrowed down to a business use case (For example, Basel Credit Risk).

In a multi-domain Data Catalog environment, you need to select the required Financial Domain that filters the Subject Areas relevant to the selected Domain or Service, Entities under the Subject Area, and Elements mapped to the Entities.

The Data Catalog is the gateway to create, view, or manage the physical instance of the Data Model.

You can use out-of-the-box metadata for Data Catalog depending on the deploying applications. Each Application can have its own Functional Data Catalog Contents. Data Services are used for managing the data movement between External Sources to Data Catalog Entities and between entities within Data Catalog.

The fundamental objectives of the Data Catalog are as follows:

- To provide a unified logical view of the Enterprise Data Model.
- To enable data discovery using predefined Metadata that is extendable by Users.
- To support end-to-end data lineage as it connects data sources and uses.

2.1 Data Catalog Key Capabilities

This section provides information about the key capabilities of the Data Catalog.

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Figure 2-1 Data Catalog Key Capabilities



Data Catalog provides the Data Model for the Financial Services Industry. The key capabilities of the Data Catalog are as follows:

- Catalog Browser: Data Catalog consists of a Viewing Framework. The Data Catalog Browser API-based Interface allows you to view the Data Catalog Components. The Catalog Browser enables the Users to go through the Data Catalog Contents and view the Business Terms by Domain, Subject Areas, and Entity. The Catalog Browser also shows the Properties of Business Terms, Contextual Definition in a User-friendly language, List of Vaues, Data Sourcing Components, and Data Quality Rules.
- In-built Data Modeling Capabilities: Data Catalog contains all the required information to establish services underlying the Data Model, which is Entities, Attributes, and the relationship between Entities and Attributes. Similar to any Entity Relationship Modeling Tool used for this purpose, the Data Catalog can build, manage and hold Data Model for the deployment purpose.
- Data Quality Checks Rule: Data Catalog Contents include Data Quality Checks Rule so the system incoming data can be verified and validated.
- Catalog Extension: Data Catalog supports a Framework to extend the Data Catalog called as the Data Catalog Extension or catalog Extension. The Catalog Extension allows user to extend the Seeded Catalog Contents to support a new or client-specific business use cases. You can add new Business Terms or customize the existing definitions when the Business Term is enforced by the external entities.
- Comprehensive Coverage: Data Catalog provides a collection of comprehensive Business Terms across the Business Lines and Use Cases.
- Data Movement: Data Catalog provides the mechanism of ‘Stage to Standardize to Process’ to move the Data along to the Result for analytical consumption. The Catalog Services are accessed through API calls used by the Data Services Module to move data.

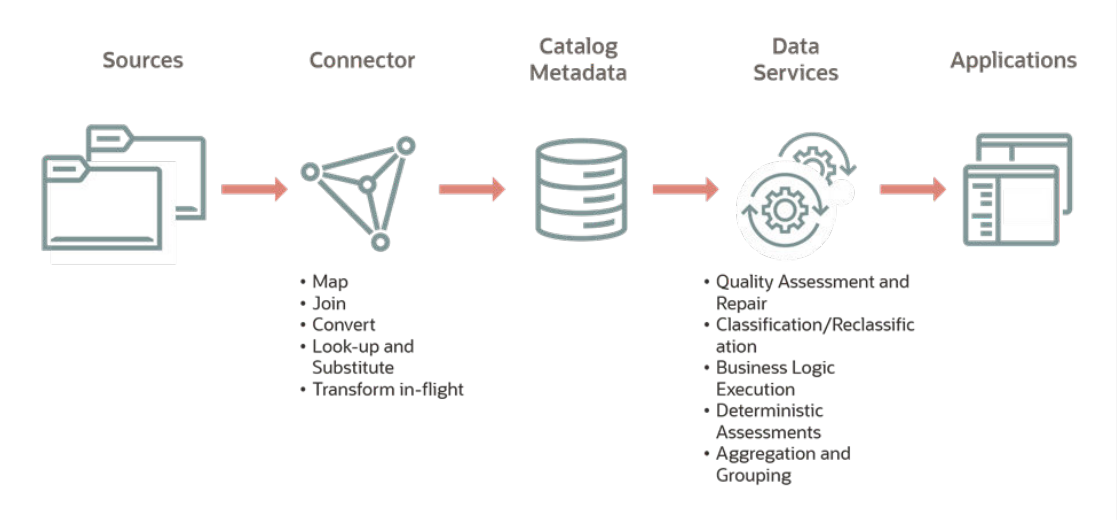
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Data Catalog Architecture

Data Catalog is at the center of sources and uses of data. Along with providing comprehensive understanding of data through the available metadata about sources and uses, it is necessary to be able to enrich or modify as required. In this direcrion OFS Data Catalog is designed to support integration with Data Sources and downstream uses, which means predefined for known uses and extendable for the unknown. The Data Catalog by Subject Area can be further segregated as Sources, Results (calculated), and Master Data that are sourced and seeded, which helps to plan the sourcing and supplying of data based on the Enterprise needs. Considering the need to serve a conglomerate of Users, the Data Catalog is embedded with a sound Governance Framework assuring the security and privacy.

Figure 3-1 Data Catalog Architecture Diagram



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Data Catalog Deployment

In the OFS Cloud Services, the Service-specific Functions (For example, Accounting Integration, Balance Computation, Reconciliation, and so on) and their relevant Business Terms are deployed.

The Deployment Process includes the Data Model upload, metadata deployments and creation of synonyms, and SLA (Sub-ledger Application) related ADI refresh tasks. The Data Catalog is the Data Model, which is grouped into Domain and Subject Areas. All the necessary Entities are mapped to the Subject Areas for the selected Domain.

4.1 Levels to Deployment

You can select the Domain during this Deployment Process. Based on the Entity to Subject Area mapping, the Entities are picked, and the Data Model upload takes place in the Domain. The deployment level is as follows:

- Domain Level Deployment

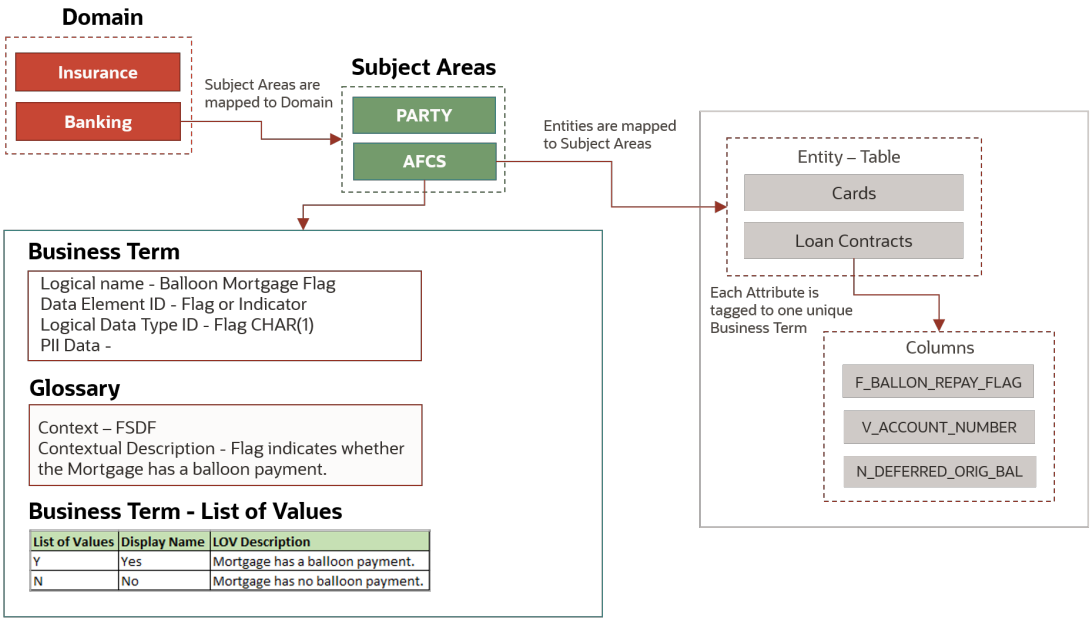
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5

Data Catalog Components

A well-defined structure is followed to seed and organize the Data Catalog Contents for efficient discovery and management. The structure starts with a Domain, which for example, in the OFSAA context can be either Banking or Insurance, and for this Domain, the Contents are created. Each Domain can have multiple Subject Areas, and a collection of Entities and Business Terms associated with those Subject Areas.

Figure 5-1 Data Catalog Components



The Data Catalog consists of the following Components:

- Domain
- Subject Area
- Entity
- Business Term
- Glossary
- Data Quality Check Rules

5.1 Domain

A Domain represents the category of the Business in the Finance Industry.

Data Catalog consists of the Data Catalog Framework and Seeded with Contents related to a specific Line of Business or Industry, which is referred to as a Domain.

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In financial services application, you can select the required Domain. For example, Banking, Insurance, and so on.

By selecting the Domain Name, you can restrict viewing the Catalog Components only to the intended Domains and deploy the Data Model also selectively.

5.2 Subject Area

A Subject Area represents a high-level data organization, which belongs to a group of related areas within a specific functional area of a Finance Organization.

Entities are grouped together into distinct Subject Areas based on the business functions or processing supported for a better identification and usage.

The relationship type between Domain and Subject Area is Many-to-Many.

The following are a few examples of Subject Areas in the Data Catalog:

- Party
- Product Processor
- Transaction
- Product

5.2.1 Relationship Between Subject Areas

Data Catalog has a provision to define the Parent-Child Relationship between the Subject Areas. Therefore, you can define the Parent-Child Relationship as follows if there is a business need:

- Domain to Subject Area Relationship

5.3 Entities

Catalog has a comprehensive list of entities to support a very wide range of analytical business use cases across Banking and Insurance domains. These entities are mapped to the subject area and the domain which helps in deploying the model, either completely or selectively, based on the services the user has subscribed.

Users can navigate through the logical layer comprising of entities using the Catalog Viewer. The physical layer comprising of table and column names are inconsequential to the user, and therefore, it is hidden from them.

5.3.1 Entity Type

Entities in the model are grouped into the following types based on data layers they are tied to:

- Download or Staging
- Result
- Dimension
- Preparation
- Integration

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Preparation and Integration Entities or layers are internal to a product. A Preparation layer contains entities used for processing while an Integration layer contains placeholders for other engines or applications to publish their processed output.

5.3.1.1 Stage Entity

Stage Entities are a part of the Unified Data-Sourcing layer for data for a wide variety of analytical needs. The Staging layer faces the operational (OLTP) and Front Office Systems of a bank. It consists of entities to capture key business and operational data from these systems, which is then processed by one or more Analytical Engines.

Since these entities are designed to facilitate loading efficiency, they are denormalized. Typically, this data is extracted from source systems and placed in the object store and then loaded to Staging Entities using data services.

5.3.1.2 Result Entity

It is a Unified Reporting or a Consumption layer. Analytical results can be simple to complex, contain quantitative and qualitative measures of a bank's Risk, Compliance, Customer and Financial Performance. The Reporting layer is a Dimensional Data Model spanning these key analytical functions. It forms the foundation of OFSAA Business Intelligence Applications but can clearly be used as the result data store for any equivalent engines and processes provided by other vendors, or custom built solutions. By providing a Single Data Repository for reporting needs, this layer provides a foundation for departmental as well as Cross-Departmental and Cross-Functional Reporting. Additionally, the schema of the reporting area is specifically built for Financial Services Analytics. As an illustration, the reporting area has a 'Run Dimension' that is shared across all BI/reporting use cases. Similarly, the aggregation of shared measures/ reporting into a common set of output structures (Account Summary) allows for Cross-Functional Reporting, which is increasingly the norm in Financial Institutions.

It is also the layer where all the input data sourced by the user through Staging Entities are persisted and available for reporting and consumption.

Along with the definition or structure of these entities, the catalog also provides mapping metadata to populate these entities from sourcing to PMF Data Pipeline.

Currently, this layer has entities to persist Journal, General Ledger Account, Transactions and Contract Data to cater to the needs of the AFCS solution.

> **Note**
>
> For any existing extractions defined on Journal, Journal Header, and General Ledger Account Data, re-select the grain, entity, and attributes and save. This will enable extraction from the Persistence layer.

> **Note**
>
> This is applicable only for the Banking domain. The PMF pipeline **Account Load Run Map Population** execution should have been completed before executing the below step. This step is required for Common Account Summary and Transaction Summary data population.

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> **Note**
>
> This is applicable only for the Insurance domain. The PMF pipeline **Policy Load Run Map Population** execution should have been completed before executing the below step. This step is required for Common Policy Summary and Transaction Summary data population.

Based on the domain (Life Insurance, Annuity, Retirement, General insurance (Property and Casualty), Health insurance, and Reinsurance issued) selected in the **Add Domain** page under **Administration**, domain specific Result Area Entities are populated.

The user must manually execute a PMF Pipeline **Result Area Entities Data Population** to populate data in the Result Area tables.

> **Note**
>
> This is specific to Banking domain. The following Target tables Accounting Entries, Accounting Entries Header, Currency Exchange Rates, General Ledger Data, Common Account Summary and Transaction Summary are used for data population in the result area.

The user must execute a PMF Pipeline **PPN to Result Area Entities Population** to retrieve the data in the Result Area tables. The Decomposed Journals to Accounting Entries data population is performed through this pipeline. This pipeline has been modified from 25A onwards to process data incrementally at every step of result area load. Data load using this mechanism is done for a given 'As of Date' and 'Run ID' filters.

> **Note**
>
> This Incremental pipeline does not support Insurance domain.

The user must manually execute a PMF Pipeline **Data Service Result Area Data Population** to retrieve the data in the Result Area tables. The persistence of day and period-to-date movement information is performed through this pipeline.

> **Note**
>
> The "As of Date" parameter value as the execution date and "Data Source" parameter value as "NA" must be passed while executing PMF Pipeline **Data Service Result Area Data Population** filters on "Effective Date" attribute in the source entity.

Management Ledger AsOfDate Results Population is used to retrieve the data in the Result Entity "Management Ledger Period Balance And Movement". The data load is done considering the entire snapshot of a given "As of Date".

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> **Note**
>
> The "As of Date" parameter value as the execution date and "Data Source" parameter value as "NA" must be passed while executing PMF Pipeline **Management Ledger AsOfDate Results Population** filters on "MIS Date" attribute in the source entity.

The user must manually execute a PMF Pipeline **Management Ledger Latest Effective Date Balance Results Population** to map the data in the Result Entity "Management Ledger Period Balance And Movement" for latest effective dates. The result area "Latest Effective Date" data population is performed through this pipeline and it processes the snapshot data from the fact entity.

> **Note**
>
> You must execute the "Management Ledger AsOfDate Results Population" and "Management Ledger Effective Date" for historical dates to view reports from earlier periods. This must be executed in the same sequence for every "As of Date".

The user must manually execute a PMF Pipeline **Revaluation Entries Results Population** to retrieve the data in the Result Entity "Accounting Entries". The revaluation entries to result area data population is performed through this pipeline.

> **Note**
>
> Select the "As of Date" parameter value as the execution date and "Data Source" parameter value as "NA" while executing PMF Pipeline **Revaluation Entries Results Population** filters on "MIS Date" attribute in the source entity.

Balance Computation Management Ledger Incremental Results Area Load PMF

In order to load incremental data of the Management Ledger Computation process, a new pipeline has been introduced to process data incrementally at every step of result area load. Data load using this mechanism is done for a given **AsofDate**.

The pre-requisite for executing the Balance Computation Management Ledger Incremental Results Area Load PMF is that the execution of Beginning of the Day (BOD) or Balance Computation Engine (BCE) or Revaluation PMF must be in the completed state. You can only execute this incremental process pipeline if any one of the above-mentioned pipeline execution is successful.

Limitations of Balance Computation Management Ledger Incremental Results Area Load PMF are:

- Parallel execution of Incremental pipeline is not allowed.
- Incremental pipeline should be executed only when no other runs are in progress (BOD, REVAL or BCE).
- Incremental pipeline should be executed only after the successful execution of any process (BOD, REVAL or BCE).

Revaluation Entries Incremental Results Population

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In order to load incremental data of the Revaluation and Revaluation retrospective process, a new pipeline has been introduced to process data incrementally at every step of result area load. Data load using this mechanism is done for a given **AsofDate**.

The pre-requisite for executing the Revaluation Entries Incremental Results Population is that the execution of Revaluation or Revaluation Retrospective PMF must be in the completed state. You can only execute this incremental process pipeline if any one of the above-mentioned pipeline execution is successful.

Limitations of Revaluation Entries Incremental Results Population are:

- Parallel execution of Revaluation Incremental pipeline is not allowed.
- Revaluation Incremental pipeline should be executed only when no other runs are in progress (REVAL or Retrospective Revaluation).
- Revaluation Incremental pipeline should be executed only after the successful execution of any process (REVAL or Retrospective Revaluation).

5.3.1.2.1 Execute Result Area Entities Run Pipeline

The steps to execute the Result Area Entities Run Pipeline are as follows:

Prerequisite:

The SCD pipeline execution should have completed before executing the below steps. For more details, see Slowly Changing Dimensions.

1. Execute the Run Pipeline after data is loaded in the Stage tables and processed
2. Use the Run Execution Parameter "As of Date" to execute for each date, to get the data in the result tables. This parameter value is applied as a filter in the source entity on "As Of Date" Business term.
3. If you execute multiple times within a day, the data is loaded with different Run Execution Skey.

   For example, if the execution is done thrice a day, the data is loaded thrice into the Target table.

   > **Note**
   >
   > You should not re run the already executed pipeline. If you re run, the execution fails due to duplicate Run Execution Skey. You can resume the execution in case of pipeline failures after fixing the errors.

4. If the execution is repeated with the new Run Skey, the entire data available in the Stage table will be loaded to the Target table.

   For more information on PMF Pipeline creation and execution, see Designing and Executing Pipelines.

5.3.2 Properties

Entity consists of a set of Attributes. Each Attribute is mapped to a unique Business Term. Each Attribute derives its characteristics such as Data Type, Constraints, and so on from the Business Definitions.

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5.3.3 Granularity

Data Catalog defines granularity of each of the Entity it holds.

Table 5-1 Granularity Level in the Data Catalog

V_GRAIN_ID	V_GRAIN_NAME
DATE	Date
ACCT	Customer Account
ACCT_TXN	Customer Account Transactions
ACCT_ENT	Accounting Entries
GL_DATA	General Ledger Data
EXCHANGE_RATE	Exchange Rates
PARTY_CONSENT	Party Consent
POLICY	Policy Identifier
REINS_HELD_POLICY	Reinsurance Held Policy
REINS_ISSUED_POLICY	Reinsurance Issued Policy

For example, as the Loan Contracts Entity contains information at the Account Level, the grains of Loan Entity is defined as ACCT.

5.4 Business Term

A Business Term is a Functional Keyword that represents a unique functional aspect of the Financial Artefacts (Entities and Attributes). There is a business meaning to each Financial Artefact, and therefore, a business name is created in the form of a Business Term. Then the Business Term is used to find and fit into a purpose of different contexts. Therefore, Business Terms are expressions of the Participants/Actors, their Activities, and requirements conveyed in common business.

The approach to arrive at the Logical View of the Physical Model has inverted in the Data Catalog. Contrary to the previous practices, first the Functional Keyword or Artefacts are identified, collated, and then expressed in common business language, and then the corresponding Physical Model is developed.

Multiple Business Terms are a part of each Subject Area. A Business Term is a singular term irrespective of multiple places it appears in and the Business Term will have a recognizable naming pattern.

Metadata is attached to the Business Terms.

The Content Structure allows you to define relationship between related Business Terms for better discovery and usage in the aspect of sourcing.

Table 5-2 Example of Relationship between Business Terms

Business Term	Related Business Term	Relationship Type
Current Write Off Amount	Write Off General Ledger Code	MEASURE_GL

To create or update a Business term, see the Create Business Terms.

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5.4.1 Business Term Properties

In the process of creating a Business Term, certain characteristics are also defined that serves as input when arriving to a Physical Model Structure. These characteristics include origin, classification, logical data type, PII term indicator, list of accepted values, and data quality check applicable for a Business Term.

To create or update a Business term, see the Create Business Terms section.

The Business Term Properties are as follows: Create Business Terms.

- Term ID
- Logical name
- Origin
- Data Element ID
- Language
- Logical Data Type ID
- PII Flag
- LOV Code
- Display Name
- LOV Description

> **Note**
>
> The Business Terms for which PII Flag is set and for those Business Terms that are used in Entities, the underlying attributes of those Entities will be redacted by applying the appropriate redaction policies. A normal user cannot query or view the redacted data. Only users with exempt redaction policy role can view or query the data.

5.4.2 Business Term Glossary

For each Business Term, there is a corresponding Glossary. The Glossary explains the meaning and purpose of each Business Term, which is the context. The Glossary consists of the information such as description, usage, sample values, and usage examples of the Business Terms.

5.4.3 Business Term List of Values

Data Catalog defines and seeds the List of Values for all the Business Terms that are Flags. The List of Values help you with data sourcing and creating Data Quality Checks.

Table 5-3 Example of Business Term List of Values

List of Values	Display Name	List of Values Description
Y	Yes	Mortgage has a balloon payment.
N	No	Mortgage has no balloon payment.

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5.4.4 Related Business Terms

Catalog has a provision to store the metadata to represent the relationship between two Business Terms along with the type of relationship.

Some information is later used for specific purpose. For example, In the case of SHARED_DEFINITION relationship type, Data Quality rules are automatically replicated for the related Business Term if there are rules existing for the Business Terms.

MEASURE_GL is another relationship type where the Business Term is a reconciliation measure and the related Business Term is corresponding to a GL account.

Table 5-4 Example of Related Business Terms

Business Term	Related Business Term	Relationship Type
Account or Contract Number	Parent Account Number	SHARED_DEFINITION
End of Period Balance	General Ledger Account Code	MEASURE_GL
Maturity Amount	Maturity Date	VALUE_AS_OF_DATE
End of Period Balance	End of Period Balance in Local Currency	CURRENCY_EQUIVALENT
Account Tenor	Tenor Unit	MULTIPLIER_UNIT

5.5 Derived Business Terms

Derived Terms are expressions or formulas used that generate values not directly available from Business Terms. Derived Terms provide users with access to pre-defined and custom data derivations. These derived terms represent calculated or logical attributes created using existing business terms, helping users understand how specific business metrics or transformations are generated.

The system provides both seeded data (predefined terms and expressions) and the ability for users to custom derive business terms tailored to specific needs.

This guide demonstrates the following.

- View existing derived terms, including both seeded and custom terms.
- Create new custom derived terms by defining expressions using business data.
- Review and manage derived terms to ensure consistency, accuracy, and relevance in your data-driven processes.

> **Note**
>
> – Derived Business Terms support only **Oracle SQL single-row functions**. For more details see, Single-Row Functions.
>
> – Aggregation and **XML/JSON** functions are **not supported**.

1. Login to the AFCS application.
2. From the Home page, navigate to **Administration**.
3. Under **Administration**, select **Derived Terms**. The **Derived Terms** page will appear, displaying all available derived terms.

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4. The **Derived Terms** list page displays key information about each derived term.

Column	Description
Name	The name of the derived term (e.g., *Account Age in Months*).
Element Type	Indicates the type of data (e.g., *Numerical Non-Monetary*, *Flag or Indicator*).
Description	Provides a short explanation of how the derived term is calculated.
View Button	Opens a detailed view of the selected derived term.

5. Use the **Search bar** to look up a term by name or description.
6. Filter results by **Seeded/Customized** or **Element Type**.
7. Use the **Sort By** drop down to arrange the list as needed.
8. Click **Create Derived Term** to define a new derived term (if you have the appropriate permissions).
9. On the **Derived Terms** list page, click the **View** button next to the term you wish to explore.
10. The **Derived Term Details** panel opens, showing two main tabs:
    - **Expression**: The **Expression** tab displays the logic or formula used to derive the term. **Example: Account Age in Months**
      Description: Refers to Account Age. The attribute is derived using the difference between the *Value Date* and *As Of Date* in months.

      ```
      TRUNC(MONTHS_BETWEEN([As Of Date],[Value Date]))
      ```
    - **References**: The **References** tab lists the specific **entities** (data domains or subject areas) where this derived term is applied, along with the corresponding expressions.

Creating a New Derived Term

1. Click **Create Derived Term** at the top-right corner of the Derived Terms page.

Table 5-5 Enter the following details

Field	Description
Derived Term Name	Name of the new derived term (e.g., Total Advance Payment Amount).
Element Type	Select the type of data (e.g., Monetary Amount, Text Description).
Description	A brief description of the derived term (e.g., "Testing Total Advance Payment Amount").
Business Terms	Select the relevant business terms associated with the derived term.

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Table 5-5 (Cont.) Enter the following details

Field	Description
Expression	Enter the formula for the derived term (e.g., CONCAT or MINUS)). **Note** The entered expression must be SQL compliant.
Justification	Provide a justification for the term (e.g., "Justification of Total Advance Payment Amount").

Note

If the expression contains syntax errors (such as missing parentheses), the system will display a Validation Failed message.

2. Verify all the details, including the term name, expression, and justification.
3. Under **Entities**, confirm where the derived term will be applied (e.g., Overdraft Accounts, Loan Contracts, Cards).
4. Click **Create** to create the new derived term.
5. After successfully creating the derived term, you will see a Submission Successful message confirming the term is created.
6. Once the derived Business Term is created, it appears in the list of derived terms and can be added to a custom ADS connector mapping template for future connector configurations.

Edit Derived Terms

The Edit option is available only for custom derived business terms.

1. To edit a derived term, navigate to the **Derived Terms** section in your Data Foundation for Banking interface.
2. Use the filter to select the term type:
   - Click the filter dropdown and select either **Custom** or **Seeded** depending on the type of derived term you wish to edit.
   - You may also use the search bar to find the term by its name or description.
3. Browse or search for the desired derived term in the list.
   a. Click the **View** button next to the derived term you want to edit. For example: "Custom Derived Account Status Date AllTest".
   b. On the term details pane, you will see the current definition including:
      - Derived Term Name (read-only)
      - Element Type (e.g., Date and Timestamp)
      - Description

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c. You can update the **Description** or other editable fields depending on the permissions.

d. Click **Continue** to proceed to the Review and Update window.

e. Click **Update** to update the derived term.

5.6 Data Quality Checks

Data Catalog Contents include Data Quality Check Rules. These Rules are defined at the Business Term and Entity Level, and seeded as a part of the Data Catalog Content. For more information on user-configurable Data Quality Rules, see Data Quality Framework.

5.6.1 Types of Data Quality Checks

The following are the types of Data Quality Checks and their definitions:

Table 5-6 Data Quality Checks

Data Quality Check	Definition
Blank Value Check	Identifies if the base column is empty considering the blank space.
Column Reference/Specific Value Check	Compares the base column data with a specific value or with another attribute of the base table.
Data Length Check	Checks for the length of the base column data by using a minimum and maximum value, and identifies if it falls outside the specified range.
Duplicate Check	Is used when a combination of the column is unique and identifies all duplicate data of a base table in terms of the columns selected for the duplicate check.
List of Value Check	It can be used to verify values where a dimension/ master table is not present. This check identifies if the base column data does not match with a value or specified code in a list of values.
NULL Value Check	Identifies if NULL is specified in the base column.
Referential Integrity Check	Identifies all the base column data that has not been referenced by the selected column of the referenced table. Here, the user specifies the reference table and columns.
Range Check	Identifies if the base column data falls outside a specified range of a Minimum and Maximum value. It ranges from "-1,000,000,000 to 1,000,000,000".
Uniqueness Check for Numeric Identifiers in Dimension	• Check to identify duplicates in Numeric Identifier Attribute for a Dimension Entity. • Check to identify changes in Numeric Identifier Attribute for a Dimension Entity for the same Business Key member.

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Table 5-6 (Cont.) Data Quality Checks

Data Quality Check	Definition
Special Character Check	Identify business term contains only the allowed set of special characters. Currently, AFCS has preconfigured rules for the following Business Terms: • Legal Entity Code • Legal Entity Description • Legal Entity Name • Data Source Code • Data Source Description For more details on allowed set of special characters, see Allowed Special Characters list.

The controls are specific to reports.

5.6.2 Use and Execute the Source Data Quality Check Process

Use this Run Pipeline (Process) to perform the Data Quality Checks on source records for various data elements.

To use and execute the Source Data Quality Check Process in the Process Orchestration, do the following:

1. To access the Source Data Quality Check Process Pipeline, on the Home Page, select the **Process Orchestration**. The **Process Modeller** Page is displayed.
2. On the **Process Modeller** Page, search and select the Source Data Quality Check Process. The **Process Flow** Page is displayed. This Process Flow is designed on the Drawing Canvas using the Transition, Activity, and Widgets Components available in the floating toolbar. RUN DQ RULE Widgets representing Data Quality Groups are set up in parallel to each other. A Data Service Widget called as Data Quality Reporting Engine is added at the end meant for reporting Data Quality Checks.
3. To view the details of any Widget, double-click on the Widget and the details related to its Activity, Transition, and Notification are displayed. On the drawing canvas, you can select and see the Definition, Data Fields, and Application Rule details.
4. To execute the Run, you can select the Run Parameter Values using the **Execution** Button on the Process Flow Page or on the Process Modeller Page.

   Go to the **Process Modeller** Page to execute the Run. Click the **Menu** Button corresponding to the Source Data Quality Check Process that needs to be executed. Click **Execute Run**. The **Execution** Page is displayed.
5. On the **Execution** Page, to execute the Run with parameters, select **With Parameters** in the **Execution Type List**. Select the required **As of Date** and **Incremental Execution** from the drop down list for which the Data Quality Checks need to be processed. The Incremental execution can be **Yes** if the newly ingested records must be validated else select as **No**. Click the **Execute** Button to initiate the Run Pipeline execution.

   Beginning with 26C Release, AFCS supports **Incremental Data Quality (DQ) Execution**, which enables data quality validation to be performed only on newly ingested records instead of the entire dataset. This feature reduces execution time and improves overall processing efficiency.

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- To use Incremental DQ execution in existing custom DQ pipelines in the 26C release, create the Incremental DQ data field and then enable the Incremental DQ parameters using the Incremental AOM API. After these configurations are complete, the Incremental DQ execution options become available in the user interface. For more information, see the Incremental DQ Parameter Configuration and Incremental DQ Data Field Configuration tables.
- To use Incremental DQ execution in the new custom DQ pipelines in the 26C release, enable the Incremental DQ parameters using the Incremental AOM API to make Incremental DQ execution available in the user interface. For more information, see the Incremental DQ Parameter Configuration table.

Create the Incremental DQ data field with the following information in the PMF. For more information, see the Data Fields section in the AFCS User Guide.

Table 5-7 Incremental DQ Data Field Configuration

Fields	Description
Data Field Code	IS_INCREMENTAL_EXE
Data Field Name	Incremental Execution
Data Field Description	Incremental Execution
Data Field Type	AOM
Is Mandatory	Yes
Scope	Process

With the 26C release, the following parameters have been introduced for the Incremental DQ feature. To make these parameters available in the user interface, users must configure them using the Incremental AOM API.

Table 5-8 Incremental DQ Parameter Configuration

Parameter Identifier	Parameter Name
120010	Incremental Execution

For more information on the Incremental AOM Parameter Process, see the AFCS API User Guide.

> **Note**
>
> The execution of the Run Pipeline is triggered using the selected Extraction Date. See the Process Orchestration Section for more details about the Process Orchestration Framework.

6. To verify the Run Execution of the Source Data Quality Check Process, do the following:
   a. To open the **Process Monitor** Page, on the **Process Modeller** Page, click the **Process Monitor** Button or select **Process Flow Monitor** on the Process Modeller Menu.
   b. The **Process Monitor** Page is displayed, which lists all the Run Instances corresponding to the Source Data Quality Check Process. On the **Process Monitor** Page, search by the Process ID, or by the **Process Name Source Data Quality Check Process**, and select the Process Instance for the required Run Pipeline (Process) that was executed

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7. The **Process Flow** Page is displayed with the Run Execution Status on each Node of the Source Data Quality Check Process.
8. To verify the Run Execution Logs, do the following:
   a. On the **Process Monitor** Page, click the required Process Instance for which you need to verify the Execution Logs. The Process Flow Page is displayed with the Run Execution Status on each Node.
   b. To see the Execution Status details of a Node, double-click on that Node. The Execution Status details Page is displayed. Click **Execution Logs**. The Log Viewer Page is displayed, which lists all the Logs related to the Process Instance. To see the details of a log entry, click the **Show More** Button. Click outside the Log Viewer Page to close it.

5.6.3 Use and Execute the Data Quality Reporting Engine Process

Use this Run Pipeline (Process) to generate and view the Data Quality report for any of the Data Quality run execution. The Data Quality Reporting Engine Pipeline uses the 'As of Date' and the 'Run Identifier' parameters to generate the Data Quality reports for run executions which are in 'Completed' status either for a passed or a failed run execution.

> **Note**
>
> Once the DQ Report has been generated for the failed DQ run pipeline, post the execution of this PMF, users must provide the Process Instance ID of the failed DQ run to the public API to view the DQ Groups that are breaching the threshold limit. For more information, see API User Guide.

To use and execute the Data Quality Reporting Engine Pipeline in the Process Orchestration, do the following:

1. To access the Data Quality Reporting Engine Pipeline, on the Home Page, select the **Process Orchestration**. The **Process Modeller** Page is displayed.
2. On the **Process Modeller** Page, search and select the Data Quality Reporting Engine Pipeline. The **Process Flow** page is displayed.
3. To view the details of any Widget, double-click on the Widget and the details related to its Activity, Transition, and Notification are displayed. On the drawing canvas, you can select and see the Definition, Data Fields, and Application Rule details.
4. To execute the Run, you can select the Run Parameter Values using the **Execution** Button on the Process Flow Page or on the Process Modeller Page.

   Go to the **Process Modeller** Page to execute the Run. Click the **Menu** Button corresponding to the Data Quality Reporting Engine Pipeline that needs to be executed. Click **Execute Run**. The **Execution** Page is displayed.
5. On the **Execution** Page, to execute the Run with parameters, select **With Parameters** in the **Execution Type List**. Select the required **Run Identifier**, **Run Purpose**, and the **As of Date** for which the Data Quality Reporting Engine pipeline must be processed. Click the **Execute** button to initiate the Run Pipeline execution.

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> **Note**
>
> User must select a valid Data Quality run under the **Run Identifier** drop-down during run execution.

> **Note**
>
> The execution of the Run Pipeline is triggered using the selected Extraction Date. See the Process Orchestration Section for more details about the Process Orchestration Framework.

6. To verify the Run Execution of the Data Quality Reporting Engine Pipeline, do the following:
   a. To open the **Process Monitor** Page, on the **Process Modeller** Page, click the **Process Monitor** Button or select **Process Flow Monitor** on the Process Modeller Menu.
   b. The **Process Monitor** Page is displayed, which lists all the Run Instances corresponding to the Data Quality Reporting Engine Pipeline. On the **Process Monitor** Page, search by the Process ID, or by the **Data Quality Reporting Engine Pipeline**, and select the Process Instance for the required Run Pipeline (Process) that was executed
7. The **Process Flow** Page is displayed with the Run Execution Status on each Node of the Data Quality Reporting Engine Pipeline.
8. To verify the Run Execution Logs, do the following:
   a. On the **Process Monitor** Page, click the required Process Instance for which you need to verify the Execution Logs. The Process Flow Page is displayed with the Run Execution Status on each Node.
   b. To see the Execution Status details of a Node, double-click on that Node. The Execution Status details Page is displayed. Click **Execution Logs**. The Log Viewer Page is displayed, which lists all the Logs related to the Process Instance. To see the details of a log entry, click the **Show More** Button. Click outside the Log Viewer Page to close it.

> **Note**
>
> When the DQ Reporting Engine executes a query in parallel, it validates the input parameters to ensure they are suitable for the Data Quality Check process. If the validation fails, the engine raises an ORA-12842 exception. The system then retries the query up to 10 times, which is the default limit.
>
> If the query still fails after the maximum number of retries, the PMF dashboard displays the following error codes:
>
> - **DCAF0740**: Maximum retry attempts reached (ORA-12842: write concurrency limit). Retry later.
> - **DCAF0741**: Maximum retry attempts reached (ORA-12842: read concurrency limit). Retry later.
>
> Users can raise a Service Request with the support team to change the retry limit for query execution.

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> **Note**
>
> If the run selected does not pertain to Data Quality or if the selected Data Quality run does not get result details for the selected filter condition (As of Date and Data Source) during the execution, "Data Quality report is not applicable for this run" message is displayed.

5.7 Fact Based Dimension Loader

The "Populating Missing Master Data from Factual Data" feature allows you to extract distinct values of the specified business term from the factual data which are missing in the Dimension table and load them into Stage Master tables. This helps to ensure that the references are accurate in the Fact Results.

This feature allows populating the stage dimension table from Stage Fact tables in case the source for dimension table did not provide the references.

1. Share the configuration as an excel file with the details such as Dimension Name, Stage Fact Table Name and Stage Fact Column Name to the support team. SOP will be prepared based on this and the configuration table will be set. The sample is as follows:

Table 5-9 Configuration

Dimension Name	Stage Fact Table Name	Stage Fact Column Name
Account	Casa	Account or Contract Number
Account	Credit Derivatives	Account or Contract Number
Accounting Standard	Commodity Contracts	Accounting Standard Code

2. After loading the Stage Fact tables, navigate to the PMF Widget **Missing Master Loader** and trigger it. Before triggering the widget, the data between the Stage Master and the Dimension must be synchronized by running the SCD.
3. For the input **As of Date**, this feature will extract distinct values of the specified Business Term (column) from the factual data which are missing in the Dimension table and load them into the Stage Master tables.

> **Note**
>
> Only **As of Date** runtime parameter is considered by the Missing Master Loader.

4. The numeric identifier field for the newly remediated data will be a 14 digit unique number and for the existing but inactive records of the dimension, it will be the existing numeric identifier. The Data Source will be set as ‘SYSTEM’.

   The non-nullable columns will be set with default values as below:

   - Varchar- 'MSG' or Space (If the length of the column is less than 3 characters)
   - Numeric- 0
   - Flag- 'N'
   - Date- As of Date provided by the user

5. Run the SCDs for the remediated Master tables and load the dimensions.

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> **Note**
>
> - In case some data is pending to be loaded to Dimension, then the SCD needs to be executed before the execution of **Missing Master Loader**.
> - Each execution of **Missing Master Loader** should be followed by an SCD execution of all the dimensions that are remediated.
> - This feature is expected to be used for only remediation of missing records and must not be primarily used for Stage Master load.

5.7.1 Steps to Perform Post Execution Failure

- In case of any failure encountered during the Missing Master Loader execution at a particular dimension, then none of the records for that dimension will be remediated and execution will fail and stop.
- Verify the execution logs to verify which dimension remediation has failed.
- Ensure the SCD is executed for all the records for that dimension.
- In case of any failures, the run can be resumed after the required fix so that only the pending dimensions will be remediated.

Points to Consider

- For customers using EDMCS as single source of dimension data, there will be some gaps between AFCS and EDMCS.
- Addition of record is limited to the dimension table and no update will be done to hierarchy tables.
- Dimensions given below cannot be remediated:
  - Prime Brokerage Agreement
  - Trade Restriction Reason
  - Asset Allocation
- Custom Dimensions created with numeric identifier of type SurrogateKey_Long are only supported for remediation.
- Parallel execution of Missing Master Loader is not allowed.
- During the Missing Master Loader execution, any parallel execution that loads data to the Stage Master of the dimensions involved in remediation is not allowed.
- Missing Master Loader is not intended to remediate large volume of records.

5.8 Slowly Changing Dimensions

A Slowly Changing Dimension (SCD) is a dimension that stores and manages both current and historical data over time in a Data Warehouse.

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> **Note**
>
> If you have entered the **Full Load** parameter as **YES**, you can load snapshot data for master tables and execute SCD process with additional parameters.
> In case, when you have entered the **Full Load** parameter as **YES** and if the load is incremental and does not contain all the nodes, those nodes are retired by default.
>
> When entered as **NO**, you can load incremental data for master tables and execute SCD process with additional parameters. The incremental data load for master tables is supported.
> The retired dimensions can be brought back as part of subsequent SCD load by updating the Closed Flag column to null or 'N'.

Current behavior of Disabled Nodes:

- The Closed Flag attribute is not supported for the Product Processor (PP) accounts.
- A new node in the Stage Master table with Closed Flag 'Y' is supported and will be ignored during SCD load.

5.8.1 Types of SCDs

The type of SCD Catalog supports is:

- Type 2 SCDs - Creating another dimension record: A Type 2 SCD retains the full history of values. When the value of a chosen attribute changes, the current record is closed. A new record is created with the changed data values and this new record becomes the current record. Each record contains the effective time and expiration time to identify the time period between which the record was active.

The Dimension Population Process in the Process Orchestration displays the available SCDs with details such as Map Reference Number and Entity Name.

5.8.1.1 Dimension Data population

Following fields are mandatory and must be sourced.

Table 5-10 Generic Dimension attribute description

Business Term	Comments
As Of Date	The data must be valid.
Code / Business Key	The data must be unique.
Numeric Identifier	Numeric Identifier data should be unique across business key values, and no two-dimensional values should share the same numeric identifier. This can be ensured by generating unique numeric IDs using the Data Integration component. Additionally, there are Data Quality (DQ) checks in place to ensure there are no duplicate numeric identifiers.
Closed Flag	For Example: Y, N, or Null. Null will be considered as No. This value determines whether the Node is enabled or disabled.
Name	The data must be valid.

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Table 5-10 (Cont.) Generic Dimension attribute description

Business Term	Comments
Description	The data must be valid.

5.8.2 Hierarchy Data Loading

A Business Hierarchy refers to organizing data into logical tree structure to represent the groups and relations among various levels at which measure can be viewed. A measure can be viewed at different levels depending upon the hierarchy breakdown of the dimension category.

Data Catalog supports data loading using the following Hierarchies:

- Account Hierarchy Dimension
- Cash Flow Type Hierarchy Dimension
- Employee Hierarchy Dimension
- General Ledger Hierarchy Dimension
- Legal Entity Hierarchy Dimension
- Line Of Business Hierarchy Dimension
- Organization Unit Hierarchy Dimension
- Party Hierarchy Dimension
- Product Hierarchy Dimension
- Project Hierarchy Dimension
- Ledger Hierarchy Dimension
- Business Unit Hierarchy Dimension
- Channel Hierarchy Dimension
- Branch Hierarchy Dimension
- Location Hierarchy Dimension
- Instrument Contract Hierarchy Dimension
- Business Segment Hierarchy Dimension

> **Note**
>
> For more information on the hierarchies, see the *Hierarchy Management* section in the AFCS User Guide.

> **Note**
>
> You must provide the snapshot for the Hierarchy code that has been corrected or modified when you reload the Hierarchy data.

Hierarchy data loading is a part of the Dimension Population Process.

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5.8.2.1 Hierarchy Data Load

Following fields are mandatory and must be sourced.

Table 5-11 Generic Dimension attribute description

Business Term	Comments
As Of Date	The data must be valid.
Hierarchy Code	Each hierarchy code for a specific As Of date must have one root node.
Effective Date	Refers to the effective date of the account or contract or interest rate or exchange rate from which it is effective. In the case of hierarchy dimension entities, it refers to the effective date of the hierarchy code, and while sourcing data, users need to provide a snapshot of the latest hierarchy code with the same effective date. The data must be valid.
Child Code	Child Code should be available in corresponding Master Table and should be unique.
Parent Code	Parent Code should be available in corresponding Master Table.
Name	The data must be valid.
Description	The data must be valid.

> **Note**
>
> As part of intra-day data load support, Hierarchy Data Load looks up for the latest record for the given date which eliminates creation of duplicate records.

5.8.2.2 Account Dimension

AFCS supports sourcing of account information from Product Processors like Annuity, Loan contracts, Repo contracts and so on. The Dimension Account must be populated through Product Processor.

> **Note**
>
> If Product Processor contains data, then Account Dimension must be populated through Product Processor and you must not populate Account Master. Also, you cannot extend Account Dimension as the extensions are only supported for Account Master path.

To populate Account Dimension through Product Processors, perform the following:

1. Execute **Account Load Run Map Population** pipeline containing the data in Product Processor tables.

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> **Note**
>
> Account Master should not contain any data.

2. Execute **Dimension Population Process** pipeline has to be executed for all dimension table population.

5.8.3 Use and Execute the Dimension Population Process

Use this Run Pipeline (Process) to manage past and historical data for various Dimensions.

To use and execute the Dimension Population Process in the Process Orchestration, do the following:

1. To access the Dimension Population Process Pipeline, on the Home Page, select the **Process Orchestration**. The **Process Modeller** Page is displayed.
2. On the **Process Modeller** Page, search and select the Dimension Population Process. The **Process Flow** Page is displayed. This Process Flow is designed on the Drawing Canvas using the Transition, Activity, and Widgets Components available in the floating tool bar. SCD Widgets representing individual SCDs are set up in parallel to each other. At the end of this process, the Connectors representing Hierarchies are set in parallel.
3. To view the details of any Node, double-click on the Node and the details related to its Activity, Transition, and Notification are displayed. On the drawing canvas, you can select and see the Definition, Data Fields, and Application Rule details
4. To execute the Run, you can select the Run Parameter Values using the **Execution** Button on the Process Flow Page or on the Process Modeller Page.

   Go to the **Process Modeller** Page to execute the Run. Click the **Menu** Button corresponding to the Dimension Population Process that needs to be executed. Click **Execute Run**. The **Execution** Page is displayed.
5. On the **Execution** Page, to execute the Run with parameters, select **With Parameters** in the **Execution Type List**. Select the required **As of Date** for which the SCDs need to be processed. Select the required **Data Source** option and click the **Apply** Button to initiate the Run Pipeline execution.

> **Note**
>
> When users re-execute the SCD for the same day, the records that are populated using previous execution will become inactive and cannot be referred in the downstream system. For a given date, for a given Business key, only one active record will be available.

> **Note**
>
> The execution of the Run Pipeline is triggered using the selected Extraction Date. See the Process Orchestration Section for more details about the Process Orchestration.

6. To verify the Run Execution of the Dimension Population Process, do the following:

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a. To open the **Process Monitor** Page, on the **Process Modeller** Page, click the **Process Monitor** Button or select **Process Flow Monitor** on the Process Modeller Menu.

b. The **Process Monitor** Page is displayed, which lists all the Run Instances corresponding to the Dimension Population Process. On the **Process Monitor** Page, search by the Process ID, or by the Process Name **Dimension Population Process**, and select the Process Instance for the required Run Pipeline (Process) that was executed.

7. The **Process Flow** Page is displayed with the Run Execution Status on each Node of the Dimension Population Process

8. To verify the Run Execution Logs, do the following:

a. On the **Process Monitor** Page, click the required Process Instance for which you need to verify the Execution Logs. The **Process Flow** Page is displayed with the Run Execution Status on each Node

b. To see the Execution Status details of a Node, double-click on that Node. The Execution Status details Page is displayed. Click **Execution Logs**. The Log Viewer Page is displayed, which lists all the Logs related to the Process Instance. To see the details of a log entry, click the **Show More** Button. Click outside the Log Viewer Page to close it.

Once this pipeline process is complete, ensure to run the **Reporting Parent Child Relation Data Population** process to create and refresh parent/child hierarchy data. For more details, see Create and Refresh Parent/Child Hierarchy data.

5.8.3.1 Create and Refresh Parent/Child Hierarchy data

OBIEE RPD is enhanced to read the data of hierarchies from database. This is achieved using views in database so that data is pre-prepared before OBIEE layer needs it. Use the Run pipeline (process) Reporting Parent Child Relation Data Population to create and refresh parent/child hierarchy data.

> **Note**
>
> This pipeline has to be executed even when custom pipeline with SCD and connector data population is complete.

To use and execute the Reporting Parent Child Relation Data Population process in the Process Orchestration, perform the following:

1. On the Home page, select the **Process Orchestration**. The **Process Modeller** page is displayed.

2. To execute the Run, you can select the Run Parameter Values using the **Execution** button on the Process Flow page or on the Process Modeller page.

   Navigate to the **Process Modeller** page and click the **Menu** button corresponding to the Reporting Parent Child Relation Data Population process that needs to be executed. Click **Execute Run**. The **Execution** Page is displayed.

3. On the **Execution** page, to execute Run with parameters, select **With Parameters** in the **Execution Type List**. Select the required **As of Date** for which the SCDs need to be processed. Select the **Data Source** as **NA** option and click **Execute** to initiate the Run Pipeline execution.

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> **Note**
>
> The execution of the Run Pipeline is triggered using the selected Extraction Date.

> **Note**
>
> Once the execution is complete, the hierarchies are displayed in the BCE Subject Area.

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6
Catalog Viewer

Catalog Viewer is the Viewing Framework of the Data Catalog.

Use the Catalog Viewer User Interface to see and understand the Catalog Components equivalent to the Data Model granularity.

6.1 View the Catalog

To use the Catalog Viewer User Interface, do the following

1. To navigate to the Catalog Viewer, on the Home Page, select **Browse Data Catalog**. The **Catalog Viewer** Page is displayed. The deployed Domain, its corresponding Subject Areas, and all the relevant Entities are listed on the Catalog Viewer Page by default. Click the Previous or Next Arrow Buttons to navigate through the full list of Entities.
2. Use the Checkboxes to filter and display the required list of Entities and their details:
    a. On the **Domains** List, select the Checkbox to filter the Entities List by the Domain Name
    b. On the **Subject Areas** List, select one or more Checkboxes associated with the Subject Areas to filter the Entities List by those Subject Areas
3. Select the required Entity to view its **Relationships**, **Attributes**, **Sourcing**, **Process Info**, and **Governance** details in the Tabs.
    - On the **Relationships** Tab, the Entity relationship details are displayed.
    - On the **Attributes** Tab, you can search and see the list of Attributes of the Entity. Select the required Attribute to see its Details and List of Values. The Details List displays the Data Type and Description of the selected Attribute. In the List of Values Section, you can sort the **Value** and **Description** information by ascending or descending order. The Attribute, which is a PII (Personally Identifiable Information), is marked with a Red colored symbol.
    - On the **Sourcing** Tab, the Entity Source Details are listed, which are Connectors. In the Connector Section, you can do the following:
        – To see the details of any Connector, click that Connector. The Connector Page displays the details.
        – To add a Connector to the Entity, click Add. For information about creating a Connector, see the Ingesting Data into AFCS Section in the OFS Accounting Foundation Cloud Service Core Functions Release 22D.
        – To delete a Connector, click the Delete Button associated with it.
    - On the **Process** Info Tab, the Data Flow Information in the Entity from the Source to the Target is displayed.
    - On the **Governance** Tab, the Data Quality Details of the Entity Attributes are listed.
4. To log an Issue for any Entity, click **Log Issue**. For information about logging an Issue, see the Issues Section in the OFS Accounting Foundation Cloud Service Core Functions Release 22D.
5. To go back to the Home Page, click the **Previous** Button.

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7

Catalog Extension

With Catalog Extension, you can extend the seeded Catalog data model to support new or client-specific business use cases. You can create new entity definitions or customize the existing entity definitions based on the use case.

Table 7-1 Enabled Data Model Extensions in Catalog

Catalog Object Type	Create	Modify	Extend	Delete
Business Term	Yes	No	No	No
Dimension Entity	Yes	No	Yes	No
Fact Entity	No	No	Yes	No
Data Quality Framework	Yes	Yes	Yes	No

All the points mentioned below are applicable to both Seeded and Custom Objects.

- Technical/Computed attributes will be added by system implicitly, user should not be adding these attributes.
- New Business Terms added to fact entities can be dimension references, measures, flag or indicators and alphanumeric attributes without dimensional reference.
- Fact logical entities that are allowed for extensions are product processors, account transactions, accounting entries, and Accounting Entries Header.
- Extensions are allowed to logical entities and physical model modification is controlled by the service.
- Required data flow for the extended entities are auto generated by the system.
- Completes basic data quality checks required for extended entities.

You must identify the additional data requirements to implement in the application through system and business use case analysis. Only functionally required/relevant attributes shall be used for extension. Data model gaps need to be captured in Issues and Action governance framework.

Data model extensions must be designed based on the guidelines provided for each area.

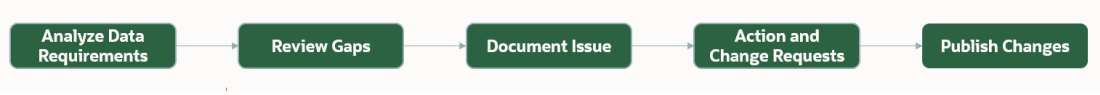
Catalog Result layer is designed as a Star Schema for better performance of Analytical and Reporting queries. Hence it is highly recommended that Dimensional Entities must be created for a pre-defined list of values before adding to the Fact Entities. Adding of alphanumeric attributes for Fact Entities must be avoided wherever possible.

7.1 Catalog Extension Process Workflow

The catalog extension process workflow is as follows:

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Figure 7-1 Catalog Extension Process Workflow



- Analyze
  - Analyze the requirements based on the existing details in Data Catalog.
  - Use the Catalog Viewer to understand existing Business Terms, logical entities and their properties.
- Review
  - Prepare the list of Gaps – additional business terms, dimensions, fact extensions and other associated properties.
  - Document the list of Gaps – group based on type and purpose of extensions.
  - Review the list of Gaps to ensure if the proposed additions are consistent and conformance according to the Data Catalog Extension Principles and Naming Standards.
- Document
  - An Issue Administrator will Log an Issue (Category as Catalog Extensions) based on the purpose of the extension. To know how to log an Issue, see the Issues section.
  - Document the details of the extension requirements in the Issue. Upload the analysis and requirement documents.
  - Assign to the Issue Owner.
- Action
  - Issue Owners create Action (Type as Catalog Extension) for the issue. It is recommended to define an action for each type of change. To learn how to create an Action, see the Actions Section in the *OFS Accounting Foundation Cloud Service Core Functions User Guide*.
  - Upload the document containing the list of changes in Action details.
  - Action Owners create or extend the catalog objects based on the type of Change Request.
  - Action Owners submits the action for approval.
- Publish
  - Issue Owner reviews submitted actions and approves or rejects along with appropriate comments.
  - After approval no modification is allowed to object definitions.
  - Issue Administrator publishes the approved Action to approve the changes in the Catalog data model.
  - Actions need to be published sequentially and in the logical sequence that would be reflected in schema. To use a Custom BT in a new Dimension Entity or while Extending the Fact, first create and publish the Business Term. Once the BT is published, it will available in the list of Available Business Terms during creation of Dimension Entity and while extending a Fact.

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- You can verify the published Actions from Catalog Viewer for Dimension Entity and Extend Fact Entity.
- Please note that extensions will be reflected in master repository of objects only on Publish and it is mandatory to publish before users can view or consume the object for further extensions.
- If a Publish action is successful, the action is displayed under Publish tab. If a Publish action is unsuccessful, the action is displayed under Approved tab.

> **Note**
>
> * To publish an action, the custom DQ rule must be mapped to at least to one group. A custom rule which is not mapped to any group will not be published.
> * Similarly, to publish an action, the custom DQ group must be mapped to at least one rule. A custom DQ group with no DQs mapped to it will not be published.

7.1.1 Overview on Logical Names for Catalog Extension

This enhancement on modifying the logical names in the Catalog Extension has been introduced to maintain the uniqueness of the logical names and to restrict configuration of Affix values in the exisiting Out-of-box logical names.

During the Catalog Extension you can configure an Affix Type such as a Prefix or a Suffix while creating a Business Term Logical Name and Entity Logical Name. The logical name that you provide will be appended with the Affix value for Business Term and the Entity during Catalog Extension. For Example: Custom BusinessTerm1, Custom Entity1.

While creating a new Business Term and an Entity, a tooltip below the Business Term Logical Name and the Entity Name text fields displays the Affix value which is already configured. By default, the Affix Type is Prefix and the Affix value configured is "Custom".

- You must not modify the configured Affix value while editing the Logical names for Business Terms or Entity.
- The Affix value is not applicable for the Whitelisted objects.
  For more information on the Whitelisted objects, see 3051777.1

7.1.2 Create Business Terms

Based on the Action created, follow the steps below to create a custom Business Term.

To create a custom Business Term for an Action, do the following:

1. Go to the **Inbox** by clicking the **Inbox** button on the Home page

   The Inbox page is displayed.

2. To create a custom Business Term for an Action, do the following:

   a. Select the required Action for which you need to create a custom Business Term.

      The Action Details Page is displayed.

   b. On the **Extension** tab, click **Create Business Term**.

      The **New Business Term** page is displayed.

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c. On the **Definition** tab, set the following values.

Table 7-2 Business Terms Field Names and Description on the Definition Tab

Field Name	Description
Business Term Logical Name	Type a unique name for the Business Term. By default, the logical name will be appended with the Affix Type which is Prefix and the Affix Value for this prefix is "Custom " with a space in the last before beginning the Business Term. For more information on the Affix Configuration, see Overview on Logical Names for Catalog Extension. For Example: Custom BusinessTerm1 Type a unique name for the Business Term Logical Name. • The Business Term needs to be long and meaningful. Short meaningless Abbreviations cannot be used. • The Business Term must always be in Camel case. • Logical names must have A to Z and 0 to 9 characters only • The Business Term can consist of alphanumeric without special characters. Maximum allowed length is 150 characters. A single space can be used as a Delimiter to separate the words. **Note** You should not create two Business Terms with the same logical name in different cases. For Example: Business Term1 and business term1. **Note** When you create a Business Term with a shared definition and extended to a Fact entity, a Referential Integrity check is automatically created.
Classification	Select one of the following categories for the Business Term: • Date and Timestamp • Flag or Indicator • List of Values • Monetary Amount • Numerical Non-Monetary • Text Description • Identifiers

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Table 7-2 (Cont.) Business Terms Field Names and Description on the Definition Tab

Field Name	Description
Logical Data Type	Select the required Logical Data Type that defines the Data Type and Length of the Business Term. For more information, see the Logical Data Type and Data Length Table. **Note** If you want to configure the List of Values, select the Logical Data Type from the following list: • Flag • Indicator • Code_Alphanumeric • Code_Alphanumeric_Long • Code_Numeric **Note** It is recommended to not have more than 10 distinct LOVs (List of Values) for lov codes definition. If the number of distinct LOVs exceeds 10, it is advisable to create a new custom dimension.
Personally Identifiable Information	Select if the Business Term is personal information. The value can be a Yes or No (Enable the Toggle Switch for Yes and disable for No). **Note** All the PII attributes created by the User is enabled for data masking while creating a cloned environment in the system.

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Table 7-2 (Cont.) Business Terms Field Names and Description on the Definition Tab

Field Name	Description
Critical Data Element	Select this option if you wish to mark a Business Term as a Critical data element. The value can be a Yes or No (Enable the Toggle Switch for Yes and disable for No). **Note** This option must be enabled for Business Terms whose value cannot be empty. **Note** If a Business Term is marked as Critical data element which is mapped to an entity, then a "Not Null Data Quality" check is created and provides information on the Business Term value that is Null.
Add	Click this button to add this Business Term in the Glossary List
Glossary Name	It is auto-populated based on the logical name of the Business Term.
Glossary Context	It is auto-populated with a pre-defined value (FSDF).
Business Term Description	Double-click on the blank space corresponding to this field and type a proper Description for the Business Term: • It must be a complete sentence with possible indication of data domain and list of values it contains along with business context. • Business term description shall be without special characters. Maximum allowed length is 4000 characters.
Delete	To delete a Glossary item, select the Glossary and click **Delete**.

Logical Data Type and Data Length

This section provides the list of the logical data type and its data length.

Table 7-3 Logical Data Type and Data Length

Logical Data Type	Data Length
Amount	NUMBER(22,3)
Amount_Long	NUMBER(38,6)
Amount_Medium	NUMBER(30,11)
Code_Alphanumeric	VARCHAR2(20)
Code_Alphanumeric_Long	VARCHAR2(60)
Code_Numeric	NUMBER(14)
Currency	VARCHAR2(3)
Date	DATE
Description_Short	VARCHAR2(100)
Description_Medium	VARCHAR2(1000)

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Table 7-3 (Cont.) Logical Data Type and Data Length

Logical Data Type	Data Length
Description_Long	VARCHAR2(4000)
Description	VARCHAR2(255)
Flag	CHAR(1)
Indicator	VARCHAR2(1)
Number_Factor	NUMBER(10,6)
Number_Factor_Long	NUMBER(38,15)
Numeric	NUMBER(10)
Numeric_Long	NUMBER(30)
Rate_Percent	NUMBER(11,6)
Rate_Percent_Medium	NUMBER(15,11)
Rate_Percent_Long	NUMBER(30,11)
SurrogateKey	NUMBER(10)
SurrogateKey_Long	NUMBER(15)
Amount_Currency	NUMBER(22,3)
Amount_Currency_Long	NUMBER(38,6)
Amount_Currency_Date	NUMBER(22,3)
Amount_Currency_Date_Long	NUMBER(38,6)

d. On the **Relationships** Tab, set the following values.

Table 7-4 Business Terms Field Names and Description on the Relationships Tab

Field Name	Description
Add	Click this button to add the Business Term in the Glossary List.
Group Code	Enter an identifier that represents that one Business Term is related to another Business Term. Group Code shall be alphanumeric with maximum 10 characters in length. An existing group code can be mentioned if the new relationship falls into existing group.
Relationship Type	Enter the relationship type that occurs between Business Terms. For more information, see the Related Business Terms.
Related Business Term	Double-click on the blank space corresponding to this field and type a proper Description.
Delete	To delete a Relationship item, select the Relationship and click **Delete**.

e. On the **List of Values** Tab, click **Add** and set the following values.

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> **Note**
>
> The Add or Delete options in List of Values tab is enabled only for the Custom Business Terms for the following Data types:
>
> - Flag
> - Indicator
> - Code_Alphanumeric
> - Code_Alphanumeric_Long
> - Code_Numeric

Table 7-5 Business Terms Field Names and Description on the List of Values Tab

Field Name	Description
Code	Enter the code for the LOV. For Example: Y. This is limited to one character and only alphanumeric character is supported and should be unique.The code is case sensitive.
Display Name	Enter the display name for the LOV.
Description	Enter the description for the LOV.

Following are the current behavior of LOV:

- The Business Term with Logical Data Type as Flag, Indicator, Code_Alphanumeric, Code_Alphanumeric_Long and Code_Numeric are allowed to have associated LOV. For other BT types, it is recommended to create a Dimension.
- LOV definition will capture Code, Display Name, and Description.
- The LOV should match the data type and data length of the Business Term.
- The Business Term follows the existing governance validations. For example: You cannot modify after the approval, only Action owner is allowed to modify, and so on. For more details, see the Approval workflow of Issues and Actions section.

Validations for Business Terms in Draft Status

- Data type of a BT that is used as a numeric identifier in create dimension and created under same action cannot be changed.
- Data type of a BT that is mapped to a dimension or fact with default value and created under same action cannot be changed.
- Data type of a BT that is mapped to a dimension cannot be changed to monetary amount types as they are factual attributes and not dimensional attributes.

Based on the list of values configured for a given custom business terms, the system auto generates data quality rules for the associated entities.

f. Click **Save**.

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> **Note**
>
> When you create an Action for the first time and wish to extend the catalog, during a Business Term or a Dimension Entity creation ,the following warning is displayed:
> "Please ensure that the affix details are configured. Click **Yes** to proceed with saving the Business Term/Dimension"

A confirmation message is displayed. Click **OK**.

g. On the **Extension** Tab, in the **Business Term Extensions** Section, the new Business Terms are listed.

h. Click **Submit** to submit the Action for approval.

A confirmation message is displayed.

i. Click **Yes** to confirm.

Your confirmation is acknowledged.

> **Note**
>
> Once a Business Term has been Approved or Published, it cannot be modified or removed from the Extension. The properties of an existing Out-of-box Business terms cannot be modified, but any new custom Business Terms which are in only **Draft** status can be modified

> **Note**
>
> If you create any custom Business Term and want to use the same in any of the custom Dimension or in extending a Fact entity, the Business Term alone must be initially published.

3. To update a draft Business Term for an Action, do the following:

a. Click the required Action for which you need to update a Business Term. The Action Details Page is displayed.

b. On the **Extension** Tab, click the Business Term that you need to update.

The Business Term Details Page is displayed.

c. You can update any Field and Click **Save**.

A confirmation message is displayed. Click OK to confirm.

d. On the **Extension** Tab, in the **Business Term Extensions** Section, the new Business Terms are listed. Click outside the Action Details Page to close it.

For information about Approval of Action (for Business Term), see the Approval workflow of Issues and Actions section.

7.1.3 Extend Business Terms

To extend a Business Term for an Action, do the following:

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1. Go to the **Inbox** by clicking the **Inbox** button on the Home Page. The **Inbox** page is displayed.
2. To extend a Business Term for an Action, do the following:
   a. Select the required Action for which you need to extend a Business Term. The Action Details page is displayed.
   b. On the **Extension** Tab, click **Extend Business Term**. The **Extend Business Term** page is displayed.
   c. Set the following values

Table 7-6 Business Term Field Names and Description

Field Name	Description
Available Business Terms	Based on the Logical Data Type selected during Business Term creation, select the required Business Term. **Note** When you extend a Business Term (already part of a fact table) with a shared definition, a Referential Integrity check is automatically created.
Critical Data Element	Select this option if you wish to mark a Business Term as a Critical data element. The value can be a Yes or No (Enable the Toggle Switch for Yes and disable for No). **Note** This option must be enabled for Business Terms whose value cannot be empty. **Note** If a Business Term is marked as Critical data element which is mapped to an entity, then a "Not Null Data Quality" check is created and provides information on the Business Term value that is Null.
Add	Click this button to add the LOV code, name, and description.
Delete	Click this button to remove the LOV data.
LOV table	If List of Values are existing, those are displayed in the table.

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Table 7-6 (Cont.) Business Term Field Names and Description

Field Name	Description
Logical Data Type	Users can increase the data length of Business Term by upgrading its logical data type. Select a logical data type from the drop-down list that provides a larger data length than the business term's current data type. **Note** • Data type cannot be changed for Out-of-the- Box Business Terms. • For LOV business terms, the data type can only be changed to another LOV-compatible data type.

Following are the current behavior of LOV:

- You can add LOV for an existing custom Business Terms for the Data Types Flag, Indicator, Code_Alphanumeric, Code_Alphanumeric_Long and Code_Numeric.
- LOV definition will capture Code, Display Name, and Description.
- The LOV should match the data type and data length of the Business Term.
- The published LOV code cannot be removed or modified.
- You can modify the display name and description for existing LOV values.
- The Business Term follows the existing governance validations. For more details, see the Approval workflow of Issues and Actions section.

Table 7-7 Business Terms Field Names and Description on the Relationships Tab

Field Name	Description
Add	Click this button to add the Relationship for Business Term.
Group Code	Enter an identifier that represents that one Business Term is related to another Business Term. Group Code shall be alphanumeric with maximum 10 characters in length. An existing group code can be mentioned if the new relationship falls into existing group.
Relationship Type	Select the relationship type that occurs between Business Terms from the drop down. For more information, see the Related Business Terms.
Related Business Term	Select the related business term from the drop down.
Delete	To delete a Relationship item, select the Relationship and click **Delete**.

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> **Note**
>
> - Users can now add relationships to the Custom Business Terms as well as Out-of-the-Box Business terms.
> - Users cannot add multiple relationships of same type for a Business Term.
> - For an Out-of-the-Box BT, users can only add the Measure GL relationship and the Business Term must be a numerical Data type.

d. Click **Save**. A confirmation message is displayed. Click **OK**. On the **Extension** Tab of the action, the new extended Business Term is listed.

> **Note**
>
> Once an extended Business Term has been Approved, the extension request cannot be modified.

3. If you want to update a draft Extend Business Terms for an Action, do the following:
   a. Click the required Action for which you need to update an extended Business Term. The Action Details Page is displayed.
   b. On the **Extension** Tab, click the Extend Business term that you need to update which is in **Draft** Status.
   c. The extend Business Terms Details page is displayed. You can update the existing values in the available fields.
   d. Click **Save**. A confirmation message is displayed. Click **OK**. On the **Extension** Tab of the action, the new extended Business terms are listed. Click outside the Action Details page to close it.

7.1.4 Critical Data Elements Assignment

Critical Data Elements (CDE) is a marker to explicitly identify critical business terms for focused error logging and reporting within the data quality framework. CDE is used to distinguish business significant failures from general data quality failures so that DQ results, error tables and reporting outputs can specifically indicate whether a failed record has a CDE related issue.

All the existing Business Terms which are not critical data elements are listed in the drop down list

Based on the Action created, follow the steps below to assign a Critical data elements to a business term.

To assign a critical data element to a Business Term for an Action, do the following:

1. Go to the **Inbox** by clicking the **Inbox** button on the Home page. The Inbox page is displayed.
2. Select the required Action for which you need to assign a critical data element for a Business Term. The Action Details Page is displayed.
3. On the **Extension** tab, click **Critical Data Elements Assignment**. The Critical Data Element page is displayed.
4. Under the **Select Business Terms** drop down list, set the following values.

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Table 7-8 Critical Data Elements- Business Terms Field Names and Description

Field Name	Description
Available Business Terms	Select the required Business Term from the available list. **Note** You can select more than one existing Business Term to be marked as Critical data elements.
Selected Business Terms	Lists the selected Business Terms to be marked as critical data elements.
Add Business Term	To add a business term, select the business term from the existing list and click **Add Business Term** button.
Delete	To remove a business term from the selected business terms field, select select the business term and click **Remove Business Term** button.

5. Click **Save** to save the Critical data element details.

   A confirmation message is displayed.

6. Click **OK**. The newly added Critical data element is displayed on the Extension tab page.

7.1.5 Manage Dimension Entity

Based on the Action created, follow the steps below to create a Dimension Entity.

7.1.5.1 Create a Dimension Entity

To create a Dimension Entity for an Action, do the following:

1. Go to the **Inbox** by clicking the **Inbox** button on the Home page. The **Inbox** page is displayed.
2. To create an Entity for an Action, do the following:
   a. Select the required Action for which you need to create a Dimension. The Action Details Page is displayed.
   b. On the **Extension** Tab, click **Create Dimension**. The **Create Dimension Entity** Page is displayed.
   c. On the **Definition** Tab, set the following values.

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Table 7-9 Dimension Entity Field Names and Description on the Definition Tab

Field Name	Description
Entity Name	Type a unique name for the Entity. By default, the logical name will be appended with the Affix Value as "Custom " with a space in the last before beginning the entity name. For more information on the Affix Configuration, see Overview on Logical Names for Catalog Extension. For Example: Custom Entity1 • Entity logical name must be in Camel case. • It must have A to Z and 0 to 9 characters only. • It must be alphanumeric with maximum length 120 characters. **Note** You should not create two Entity names with the same logical name in different cases. For Example: Custom ENTITY1 and Custom entity1.
Entity Description	Enter a description for the Entity. **Note** New line character (Enter key) should not be used in the Entity Description field. • It must be a complete sentence with possible indication of data domain and list of values it contains along with business context. • It must be alphanumeric with maximum length 4000 characters.
Is this a Mapper	Select this option if you wish to create a mapper entity. The value can be a Yes or No (Enable the Toggle Switch for Yes and disable for No). Mapper BT Type column is visible. **Note** This field is optional. Users can select this option only if you wish to have attributes with additional properties. Once this option is enabled, no other hierarchical entities can be created.
Should this Entity contain hierarchical data	Select if the Dimension Entity contains hierarchical data. The value can be a Yes or No (Enable the Toggle Switch for Yes and disable for No). Keep this switch enabled if not absolutely sure if the new dimension will not contain hierarchical data as modification to published dimensions are not supported and required physical structure and data flow for hierarchical data cannot be enabled later.

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Table 7-9 (Cont.) Dimension Entity Field Names and Description on the Definition Tab

Field Name	Description
Available Business Terms	Based on the Logical Data Type selected during Business Term creation, select the required Business Term to be added to the Dimension entity. **Note** You must add a minimum of two business terms such that at least one is a business key (i.e., natural key of the dimension) with an alphanumeric code column, and one is a numerical identifier (its unique numerical value for the corresponding business key). **Note** Only Custom Business Terms can be selected as Business key. **Note** An error is displayed if you are trying to create multiple dimensions with the same business terms as the business key. If role-based dimensions are required, then it is recommended to create separate business terms for each role and use them as a business key in dimensions.**For Example:** Issuer, Guarantor, an so on. • A Business Term is displayed in the Business Terms selection column only after it is published. You can then add the relevant Business Term while creating the Dimension Entity. • Add only slowly changing attributes to dimension entity, don't add numerical measures, surrogate key(s). • Only functional business terms can be added to the dimension. Technical business terms (Record Start Date, Record End Date, Latest Record Indicator) are added to the dimension by the extension service. • Flag the BTs which are nullable, by default all new additions and Not Null. • Avoid adding alphanumeric business terms to fact entity(s) which does not have an associated dimension. • The Dimension retire parameter should not be set for custom dimensions. • Business Terms with logical data type SurrogateKey_Long are mapped as Numeric Identifiers. • There must be alteast one Source Code, Source Name, Target Code and Target Name for the selected Business Terms. There can be more than one Source Code and Name attribute. • The Source and Target attributes must not be the same.

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Table 7-9 (Cont.) Dimension Entity Field Names and Description on the Definition Tab

Field Name	Description
	• Member Name and Description fields are used to mark the name and the description for a dimension explicitly. Only one Business Term can be marked for Member Name and Member Description for a custom dimension. • It is not mandatory to set the Member Name and Member Description for a Dimension. • Member Name and Description are not supported for Out-of-the-box entities. **Note** Attribute mapping is not available for custom dimensions created prior to release 26C, as the Extend Dimensions feature does not support modifying attribute values. **Note** Please submit a service request for any legacy custom dimensions that require Member Name and Member Description fields. • The Latest Record Indicator, Record Start Date, Dimension Value Closed Flag and Record End Date are the implicit columns and cannot be added while selecting a Business Term during dimension creation. While trying to add the following error message is displayed " The selected business term is managed by the system and cannot be added manually". • Any custom Business Term which is in unpublished state can now be added while creating a dimension in the same Action during catalog extension. **Validations for Business Terms in Draft Status** – Data type of a BT that is used as a numeric identifier in create dimension and created under same action cannot be changed. – Data type of a BT that is mapped to a dimension or fact with default value and created under same action cannot be changed. – Business key of a dimension cannot be changed when it is mapped to a fact entity in the same action. – Data type of a BT that is mapped to a dimension cannot be changed to monetary amount types as they are factual attributes and not dimensional attributes. It is recommended to add a Business Term with logical name that contains the key word name, which defines the business key of the dimension. This will be used to define the child name in hierarchical data.
Add Attribute	Click this button to add the Attribute (Business Term) in the Business Terms List.

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Table 7-9 (Cont.) Dimension Entity Field Names and Description on the Definition Tab

Field Name	Description
Remove Attribute	Click this button to remove the Attribute (Business Term) from the Business Terms List.

d. Click **Save**. A confirmation message is displayed. Click **OK**. On the **Extension** Tab, in the **Entity Extensions** Section, the new Dimension Entity is listed.

Logical dimension entity definition creates all the required physical structures. The Data flow(SCD) is created by the extension service along with entity definition. You must create a pipeline to add the SCDs created by the extension service.

When the Hierarchical data toggle button is enabled, a data Flow (Connector) is created by the extension service along with Stage Hierarchy and Dimension Hierarchy. You must create a pipeline to add the Connectors created by the extension service.

Create a new pipeline and the Data Quality group created for new entity (if any). A single pipeline can be created to add all the newly created Data Quality groups for catalog extensions.

> **Note**
>
> Once a Dimension Entity has been Approved it cannot be modified or removed from the Extension.

3. If you want to update a draft Entity for an Action, do the following:
   a. Click the required Action for which you need to update a Dimension Entity.

      The Action Details Page is displayed.
   b. On the **Extension** Tab, click the Dimension Entity that you need to update which is in **Draft** Status.
   c. The Entity Details Page is displayed. You can update any Field.
   d. Click **Save**. A confirmation message is displayed. Click **OK**. On the **Extension** Tab, in the **Entity Extensions** Section, the new Dimension Entities are listed. Click outside the Action Details page to close it.

7.1.5.2 Extend Dimension Entity

To extend a Dimension Entity for an Action, do the following:

1. Go to the **Inbox** by clicking the **Inbox** button on the Home Page. The **Inbox** page is displayed.
2. To extend an Entity for an Action, do the following:
   a. Select the required Action for which you need to extend a Dimension. The Action Details page is displayed.
   b. On the **Extension** Tab, click **Extend Dimension**. The **Extend Dimension Entity** page is displayed.
   c. On the **Definition** Tab, set the following values

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Table 7-10 Dimension Entity Field Names and Description on the Definition Tab

Field Name	Description
Dimension	Select the appropriate dimension from the drop-down list.
Available Business Terms	Based on the Logical Data Type selected during Business Term creation, select the required Business Term to be added to the Dimension entity. **Note** You must not extend a Dimension or a Fact table with a Business Term of Data Type 'TimeStamp". • Any custom Business Term which is in unpublished state can now be added while creating a dimension in the same Action during catalog extension.

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Table 7-10 (Cont.) Dimension Entity Field Names and Description on the Definition Tab

Field Name	Description
Selected Business Terms	This field displays the selected business terms for the extended dimension entity. • You must add a minimum of one business term. • The default value cannot be empty when nullable is disabled. • The maximum size allowed for the default value is 10. • Member Name and Description fields are used to mark the name and the description for a dimension explicitly. Only one Business Term can be marked for Member Name and Member Description for a custom dimension. • It is not mandatory to set the Member Name and Member Description for a Dimension. • Member Name and Description are not supported for Out-of-the-box entities. **Note** Attribute mapping is not available for custom dimensions created prior to release 26C, as the Extend Dimensions feature does not support modifying attribute values. **Note** Please submit a service request for any legacy custom dimensions that require Member Name and Member Description fields.
Add Attribute	Click this button to add the Attribute (Business Term) in the Business Terms List. **Note** You cannot add an Amount column as an attribute in the dimension.
Remove Attribute	Click this button to remove the Attribute (Business Term) from the Business Terms List.

d. Click **Save**. A confirmation message is displayed. Click **OK**. On the **Extension** Tab, in the **Entity Extensions** Section, the new extended Dimension Entity is listed.

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> **Note**
>
> Once an extended Dimension Entity has been Approved, the extension request cannot be modified

3. If you want to update a draft Entity for an Action, do the following:
   a. Click the required Action for which you need to update a Dimension Entity. The Action Details Page is displayed.
   b. On the **Extension** Tab, click the Extend Dimension Entity that you need to update which is in **Draft** Status.
   c. The Entity Details Page is displayed. You can update the existing values in the available fields.
   d. Click **Save**. A confirmation message is displayed. Click **OK**. On the **Extension** Tab, in the **Entity Extensions** Section, the new extended Dimension Entities are listed. Click outside the Action Details page to close it.

   - The seeded dimensions can be extended by only custom Business Terms and custom dimensions can be extended by seeded as well as custom Business Terms.
   - Once the publish action is complete, the Dimensions will be added with new attributes and also their corresponding SCDs will be modified.
   - Also if the added attribute has a DQ associated with it, it will be added to the DQ Group.
   - You can view the modified changes to the Dimension using Catalog Viewer section in the *OFS Data Catalog User Guide*.

7.1.6 Extend Fact Entity

Based on the Action created, follow the steps below to Extend Fact Entity.

To Extend Fact Entity for an Action, do the following:

1. Go to the **Inbox** by clicking the **Inbox** button on the Home page. The Inbox page is displayed.
2. To Extend Fact Entity for an Action, do the following:
   a. Select the required Action for which you need to Extend Fact Entity. The Action Details Page is displayed.
   b. On the **Extension** Tab, click **Extend Fact**. The **Extend Fact Entity** Page is displayed.
   c. On the **Definition** Tab, set the following values.

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Table 7-11 Extend Fact Field Names and Description on the Definition Tab

Field Name	Description
Grain/Grain Group	Select one of the following categories for the Entity: • Customer Account Transactions • Accounting Entries • Customer Account • Others Select the appropriate grain for the entities to be extended. **Note**: The **Include Entities** and the **Available Business Terms** field values are displayed for selection sequentially, based on the Grain selection.
Include Entities	Select an Entity from the list of available entities. **Note** The list of unsupported entities for extension are Dimension, Stage Master and Stage Hierarchy Tables.
Add Entity	Click this button to add this Entity in the Entities List.
Remove Entity	Select the entity, and click this button to remove an entity from the added list of Entities.

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Table 7-11 (Cont.) Extend Fact Field Names and Description on the Definition Tab

Field Name	Description
Available Business Terms	Select one or more Business Terms to the Fact Entity: • Nullable: If a Business Term has Null value or not • Default Value: The Default value for the Business Term • Reference Entity: The list of dimensions for which Business Terms is a Business Key. **Note** If you disable the Nullable option for an added Business term, then it is mandatory to add a default value for the same business term. • Verify the Business Terms that are not already part of the entity(s) to be extended. • Mark the business terms as not null only when absolutely necessary. • In case of a BT marked as not null, system mandates to provide a default value as per the data type and data length of BT definition. • Avoid adding alphanumeric business terms to fact entity(s) which does not have an associated dimension. • The Business Term 'Record Creation Date' should not be used for custom extensions. • The system populates the dimension list referenced by a Business Term and allows you to select the referenced dimension entity in case of multiple references. In case of single reference entity, the reference entity is auto-populated. • Any custom Business Term which is in unpublished state can now be added while creating a dimension in the same Action during catalog extension. **Validations for Business Terms in Draft Status** – Data type of a BT that is mapped to a dimension or fact with default value and created under same action cannot be changed. – Business key of a dimension cannot be changed when it is mapped to a fact entity in the same action. • Any dimension which is in unpublished state can now be added while extending Fact in the same Action during catalog extension. **Note** You must not extend a Dimension or a Fact table with a Business Term of Data Type 'TimeStamp'.
Add Attribute	Click this button to add this Attribute in the Business Terms List.
Remove Attribute	Click this button to remove an attribute from the added list of Business Terms.

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d. Click **Save**. A confirmation message is displayed. Click **OK**. On the **Extension** Tab, in the **Entity Extensions** Section, the new Fact Entity is listed.

You must select the appropriate grain or group for the entities to be extended and verify if the Business Terms are not already part of the entity(s) to be extended. The Best practice is to add a referenced dimension before adding an alphanumeric Business Terms to the fact entities.

You must limit the number of extensions to 100 Business Terms for each Fact Entity and 950 Business Terms at a grain level.

> **Note**
>
> To increase the number of extensions above 100 for a Fact Entity, it can be reviewed through an SOP. For more information, contact the My Oracle Support (MOS) team.

You can create the Data Quality pipeline for the extension generated Data Quality checks for the extended entity.

> **Note**
>
> Once a Fact Extension has been Approved it cannot be modified or removed from the Extension.

> **Note**
>
> The Fact Entity can be extended only by custom Business Terms.

3. If you want to update a draft Extend Fact Entity for an Action, do the following:
   a. Click the required Action for which you need to update an Extend Fact Entity. The Action Details Page is displayed.
   b. On the **Extension** Tab, click the Extend Fact Entity that you need to update.
   c. The Entity Details Page is displayed. You can update any Field.
   d. Click **Save**. A confirmation message is displayed. Click **OK**. On the **Extension** Tab, in the Entity Extensions Section, the new Extend Fact Entities are listed. Click outside the Action Details Page to close it.

7.1.7 Data Quality Framework

Data Quality Framework consists of a scalable rule-based engine that uses a single-pass integration process to standardize, match, and duplicate information across global data. This framework within the Infrastructure system facilitates you to define rules and execute them to query, validate, and correct the transformed data existing in an Information Domain.

7.1.7.1 Create a Rule

You can create a Data Quality Rule definition by specifying the DQ Definition details.

The following capabilities are supported:

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- Ability to create three types of Custom DQ rules: Mandatory, Range, Comparison.
- Ability to edit Custom DQ rules in Draft, Returned and Published status.
- Ability to delete Custom DQ Rules in Draft or Returned status.

Mandatory

Custom DQ Mandatory rule is a combination of Null Value and Blank Value. Check for alphanumeric or character type of base attribute and it is Null Value Check for other types of base attribute.

Range

The Range option is supported only for attributes of numeric and date types.

Comparison

- The comparison check allows you to compare the attributes with the following options:
  - Specific Value- This option allows you to compare the base attribute with a specific value based on the type of base attribute selected.

    > **Note**
    >
    > Single quote special character is not allowed in the value field.

  - Another attribute- This option allows you to compare the Comparison Base Attribute with the Comparison Attribute, where the Comparison Base Attribute and Comparison Attribute are the attributes of the base entity or of the associated dimensions that are referenced by the base entity.

  To compare using another attribute option, enter information in the following fields:

  - Comparison Base Entity- This dropdown lists the base entity along with the associated dimensions that are referenced by the base entity. By default, this field is populated with base entity.
  - Comparison Base Attribute- This dropdown lists all the attributes of the entity selected in the Comparison Base Entity field. By default, this field is populated with base attribute.
  - Operator- Select the appropriate value from the dropdown list.
  - Comparison Entity- This dropdown lists the base entity along with the associated dimensions that are referenced by the base entity.
  - Comparison Attribute- This dropdown lists all the attributes of the entity selected in the Comparison Entity field.
- The comparison option allows you to compare the attributes which are only compatible to be compared. When you use this option with alphanumeric or character type of Comparison Base Attribute, equal sign operator alone is supported.

Ensure the Issue is created with the Category as **Data Accuracy** and Source as **Catalog** and the Action Type as **Data Accuracy**.

To create a Data Quality Rule, complete the following steps:

1. From the **Inbox** page, click the action for which you want to create a DQ rule.

   Now click **Control Extensions** from the LHS menu.

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> **Note**
>
> You can create a rule only from the action which is in **New** or **Returned** status.

2. Click **Create Rule**.

   The **Create Rule**window is displayed.

> **Note**
>
> The **Action ID** is populated by default.

3. Enter a **Description** or related information about the rule definition.
4. Add **Comments**, if required.
5. Select the entity for the rule from the **Entity Name** drop-down list.

   Based on this selection, the associated attributes are populated in the **Attribute Name** list.
6. Select the attribute from the **Attribute Name** drop-down list.
7. Select the **Rule Type**. The options are **Mandatory**, **Range**, and **Comparison**.
8. Based on the **Rule Type** selected, additional fields are displayed. Provide the required information.
9. Click Add button to add or select the **Data Quality Rule Filter**. The Data Quality Rule Filter screen is displayed.

   Click **Add Filter** icon and enter the name for the filter. Click **+ Condition** button to enter the filter conditions. The selected conditions are displayed in the **Expression** field and click **Save**.

   Custom Data Quality framework supports defining advanced filters on referred dimensional attributes of the base entity on which the data quality check is being defined. To define the filter referencing dimensions, in the **Comparison Entity** drop-down, select the reference/ base entity and in the **Comparison Attribute** drop-down, select the attribute of comparison entity. Comparison attribute can be compared against the specific value or attribute of the base entity based on the radio button selection.

   Users may define filters to compare attributes of comparison entity to base entity attributes as well as to a specific value or list of values (using IN/NOT IN operators).

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> **Note**
>
> Following are the behavior of the Custom DQ Filters:
>
> - Mapping a filter to a custom DQ rule is not mandatory. So, a custom DQ rule can be saved and published with or without filter.
> - Filters can be reused across custom DQ rules.
> - Filter cannot be edited or deleted if it is mapped to a custom DQ rule.
> - You can only change or un-map a filter from a custom DQ rule, whenever a custom DQ rule is in Draft, Returned or Published state.
> - Filter conditions can only be defined on the attributes of an entity on which filter is defined.
> - Filter conditions defined on text columns only supports **Equals** , **Not Equals**, **IN**, and **NOT IN** operator when compared against value(s).
> - The value field of filter conditions defined on text based columns can only contain following special characters: hyphen, comma, underscore and full stop.
> - The filter name should be unique throughout an entity and can only contain following special characters: hyphen, comma, underscore and full stop.
> - The maximum supported length for a filter expression having no dimension entity reference is 3800 characters.

10. Click **Save**.

    The Rule code is automatically populated, and the rule is displayed in the **Control Extensions** page.

7.1.7.2 Edit a Rule

You can edit the existing Data Quality Rule definition details.

To edit a Data Quality Rule, complete the following steps:

1. From the **Inbox** page, click the action for which you want to edit the DQ rule. Now click **Control Extensions** from the LHS menu.

> **Note**
>
> You can edit a rule only from the action which is in **New** or **Returned** status.

2. Click the rule which you want to edit.

> **Note**
>
> - Custom DQ Rules in Draft, Returned, or Published status can only be edited.
> - Rule Type cannot be edited.
> - Base Entity and Attribute cannot be edited for Custom DQ Rules in Published status.

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3. Modify the details and click **Save**.

   The Rule is updated.

7.1.7.3 Delete a Rule

You can delete the existing Data Quality Rules.

To delete a Data Quality Rule, complete the following steps:

1. From the **Inbox** page, click the action for which you want to delete the DQ rule. Now click **Control Extensions** from the LHS menu.

   > **Note**
   >
   > You can delete a rule only from the action which is in **New** or **Returned** status.

2. Click the **Edit Rule** option.

   The **Edit Rule** page is displayed.

3. Select the rule which you want to delete and click the **Delete** icon.

   > **Note**
   >
   > Custom DQ Rules in **Draft** or **Returned** status can only be deleted.

   The Rule is deleted.

7.1.7.4 Create a Group

Data Quality Groups facilitate the logical grouping of the defined DQ definitions and to schedule their execution.

The following capabilities are supported in the 23.2.1 release:

- Ability to create Custom DQ groups based either on an entity or on an existing group.
- Ability to map the following three types of rules to the group:
  - Seeded DQ Rules
  - Published Custom DQ Rules
  - Unpublished Custom DQ Rules of the same action

> **Note**
>
> - A custom DQ group can be created only from Rules of same Entity.
> - No DQ rule is deleted or created while editing a Custom Group. Only the mapping is updated.

- Ability to delete Custom DQ groups in Draft or Returned status.
- Ability to edit Custom DQ groups in Draft, Returned or Published status.

To create a Data Quality Group, complete the following steps:

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1. From the **Inbox** page, click the action for which you want to create a DQ Group. Now click **Control Extensions** from the LHS menu.

> **Note**
>
> You can create a Data Quality Group only from the action which is in **New** or **Returned** status.

2. Click **Create Group**.

   The **Create Group**window is displayed.

3. Enter the **Name** of the group. The name can consist of alphanumeric characters and an underscore (_).
4. Enter a **Description** or related information about the group.

> **Note**
>
> The description field does not support new line.

5. Select an **Entity**.
6. However, if you want to create a new group from an existing group, enable the **Create Data Quality Group from an existing DQ group** option and select the required group from the **Copied from Data Quality Group** drop-down list.
7. Click + to link the DQ rules for the selected entity. Select the required rules and click **Link**.
8. Click **Save**.

   The group code is automatically populated, and the group is displayed in the **Control Extensions** page.

7.1.7.5 Edit a Group

To edit a Data Quality Group, complete the following steps:

1. From the **Inbox** page, click the action for which you want to edit the DQ Group. Now click **Control Extensions** from the LHS menu.

> **Note**
>
> You can edit a Data Quality Group only from the action which is in **New** or **Returned** status.

2. Click the group which you want to edit.

> **Note**
>
> Custom DQ Groups can be edited in Draft, Returned, or Published status. Group's description and DQ rules that are mapped to the Custom DQ Group can be edited in Draft, Returned, or Published status. However, Group's name can only be edited for Custom DQ Groups that are in Draft or Returned status.

3. Modify the details and click **Save**.

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The group details are updated and displayed in the **Control Extensions** page.

7.1.7.6 Delete a Group

You can delete the existing Data Quality Groups.

To delete a Data Quality Group, complete the following steps:

1. From the **Inbox** page, click the action for which you want to delete the DQ Group. Now click **Control Extensions** from the LHS menu.

> **Note**
>
> You can delete a Data Quality Group only from the action which is in **New** or **Returned** status.

2. Click the **Edit Group** option.
3. Click on the DQ Group which you want to delete and click the **Delete** icon.

> **Note**
>
> Custom DQ Groups in Draft, or Returned status can only be deleted.

The Group is deleted.

7.1.7.7 Limitations

Following are the behavior of Data Quality Rules and Groups:

- Multiple entities' rules are not allowed in the DQ Group.You must define DQ group only for one entity.
- You cannot delete custom DQ Rules/Groups which are in Published, Approved, or Submitted status. You can only delete custom DQ rules/groups that are in the Draft or Returned status.

7.1.8 Data Entry

Introduction of Data Management Interface in the AFCS application to enable users to add, edit data directly in the custom dimensions using DMI forms. The user can create DMI forms for a pre-specified set of entities and get a new Action Type in Issues and Actions - 'Data Entry' to use the defined forms.

7.1.8.1 Create Data Entry

Based on the Action created, follow the steps below to create a Data Entry. Users can add, modify and upload the data related to stage equivalent of custom dimensions.

To create a Data Entry for an Action, do the following:

1. Go to the **Inbox** by clicking the **Inbox** button on the Home page

   The Inbox page is displayed.

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> **Note**
>
> Users must create an issue of category 'Catalog Extension' and then create an action of type 'Data Entry' from this issue.

2. To create a Data Entry for an Action, do the following:
   a. Select the required Action for which you need to create a Data Entry.

      The Action Details Page is displayed.
   b. On the **Data Entry** tab, Select the **Form Name** from the drop down and click **Proceed**.

      The **New Data Entry** page is displayed.

      > **Note**
      >
      > If a form defined on an entity is not published or closed, then the same or another form defined on the same entity cannot be used in another action.
   c. Click the **Add Row** icon,and under **Actions** click **Edit** option and enter the details.
   d. Click **Save** after adding each record.

      The data entry is saved successfully.
   e. Close the data entry page.

      > **Note**
      >
      > For data entry actions that are in 'Draft' or 'Return' status, you can select another data entry form.

      > **Note**
      >
      > When you select another form before the submission of the newly added data entry form, a confirmation message is displayed as " Data Entry form saved earlier will be erased, do you want to proceed? ". Click **Yes** to proceed else click **No**.
   f. On the **Data Entry Action** page, click **Submit** to submit the Action for approval.

      A confirmation message is displayed.

      > **Note**
      >
      > If the action is submitted for approval, the status of the record is changed to **Awaiting** status.
   g. Click **Yes** to confirm.

      Your confirmation is acknowledged.

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> **Note**
>
> The user who submits the data entry action, cannot return or publish the same action.

For information about Approval of Action, see the Approval workflow of *Issues and Actions* section in the AFCS User Guide.

3. Once the data entry action is approved, it will be available under the **Approved** tab in the Publish Change Request.

   For more information on publishing an action, see Publish an Action.

> **Note**
>
> After publish, the status is changed from **Awaiting** to **Ready** status for successful records and the status of the failed records are set to **Draft** status.
> The failed and successful records count can be viewed on the click of actions under **Publish** under **Publich Change Request** tab.

4. To update a draft records in Data Entry form for an Action, do the following:
   a. Select **Draft** from the Status drop-down list, to view all the entity records that are in draft status.
   b. To edit a record, click **Edit** icon next to the record.
   c. Enter the values in the attributes that you want to modify and click **OK**. You can repeat the steps for all the records for which the data needs to be entered.
   d. To modify all the entries in a specific column, click **BulkUpdate**.
   e. Select the column to modify the data, enter the new value and click **OK**.
5. To delete a draft records in Data Entry form for an Action, do the following:

> **Note**
>
> You can delete the records which are in Draft status. If the record is published and moved to Ready status, it cannot be deleted.

   a. Select the **Draft** option from the Status drop-down list. The entity records with Draft status are displayed for entering the data.
   b. Select a record and click **Delete** icon.
   c. To delete multiple records, select all the required records and click **Delete**.
   d. To bulk delete all the records, select the check box on the Header. All the records are selected, then click **Delete**.
6. To edit the published records in Data Entry form for an action, do the following.

   The published records are set to Ready Status. When you edit the record, it is moved to Draft status.
   a. Select the **Ready** option from the Status drop-down list, to view the entity records with Ready status.

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b. To edit a record, click **Edit** icon next to the record.

c. Update the values for the attributes that you want to modify and click **OK**.You can repeat the steps for all the records for which the data needs to be entered.

> **Note**
>
> Refrain from updating **As of Date** and **Business Key** attributes.

d. To modify all the entries in a specific column, click **BulkUpdate**.

e. Select the column to modify the data, enter the new value and click **OK**.

f. Click the modified record in Draft status, and then click **Submit** for Approval.

g. To submit multiple records, select all the required records and click **Submit**.

h. To bulk submit all the records, select the check-box on the header. All the records are selected, then click **Submit**.

7.2 Publish Change Request

Approved change requests for Catalog extensions must be published by Administrators to persist the extensions and generate associated configuration.

7.2.1 Publish Change Request Process Workflow

Publish change request process spans across multiple components involving automation of complex configurations as explained below:

Figure 7-2 Publish Change Request Process Workflow



- Model Upload
  - The Data catalog extension generates a model artifact in the Object store.
  - The Physicalization of the above model and the object registration will be performed in the system.
- Slowly Changing Dimensions Publish
  - The Slowly Changing Dimensions (SCD) definition of new entities that are part of the model are registered with the system.
- Data Quality Publish
  - The Data Quality definition of new entities that are part of the model are registered with the system.
- Data Redaction for GDPR

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  - Any PII attribute part of the Data catalog extension model is implicitly eligible for the redaction which safe guards the data against any unauthorized access and the data theft.
- Connector Metadata Refresh (ADI Refresh)
  - This reads the data catalog extension model uploaded in the system and creates ADIs.
  - This is a mandatory activity for any model change.

> **Note**
>
> Starting with release 26C, all new custom entities are automatically partitioned to support optimized data ingestion features, such as truncate-and-reload. Existing custom entities created before 26C do not receive this update automatically. Please submit a service request for any legacy custom entities that require partitioning as require specific manual data maintenance.

> **Note**
>
> Steps are automated and internal while triggering publish process.

7.2.2 System Restrictions during Publish Change Request Operations

This section provides information on the operations that can be performed and the system restrictions during a Publish Change Request.

7.2.2.1 Operations which can be performed during Publish Change Request

The following activities are allowed by the system during a Publish Change Request operation.

- Browse Data Catalog
- Balance Reconciliation
- Catalog Extension
- Issues and Actions
- Upload and Download files
- Legal Entity
- Report Analysis
- Access Data Visualization
- Revaluation Settings
- System Administration - creating users and modifying user access

7.2.2.2 Operations which cannot be performed during Publish Change Request

The following activities are restricted by the system during a Publish Change Request operation.

- SLA Configuration or modifications
- Data Ingestion Connector creation or modification or copy

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- Data Extraction
- Process Pipeline Executions
- CoA Segment Mapping

7.2.3 Publish an Action

To publish an Action, do the following:

1. Go to **My Profile** by clicking the **My Profile** Button on the Home Page.
2. Select **Administration**. The Administration Page is displayed.
3. Navigate to the **Publish Change Request** Tab. The list of Actions in **Approved** status is displayed.
4. To publish an Action, do the following:
   a. Select the required Action and click **Publish** from the list of available actions. Users can bulk publish only the actions that are of "Catalog Extensions" type.

      > **Note**
      >
      > Bulk publish operation is not supported for the following action types:
      >
      > - Data Accuracy - Rule Extensions
      > - Segments
      > - Data Entry

      A confirmation message is displayed. Click **OK** to acknowledge the message.

      > **Note**
      >
      > Once the publish is triggered, check the availability of actions under **Published** tab before retriggering it.

   b. To view the list of “Fail to publish” actions, click the **Approved** button. The list of actions to be published are displayed.

      > **Note**
      >
      > If a Publish action is unsuccessful, the action is displayed under **Approved** button. You can publish this action again or contact My Oracle Support (MOS) for further assistance.

   c. To view the list of ongoing publish operations, click the Ongoing button. The list of ongoing publish operations is displayed.

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> **Note**
>
> The publish operation might take upto 2 hours to complete and the User can navigate out of the User Interface and comeback later to check the status of the event. If the publish operation is still **Ongoing** after 2 hours, contact My Oracle Support (MOS) for further assistance.
> Publish action cannot be performed during an ongoing Process Pipeline execution. The user can perform the Publish action once all the PMF executions are complete.
>
> Similarly, Process Pipeline execution should not be performed during an ongoing Publish operation of a Change Request. If a process is triggered during an ongoing Publish, the process will be cancelled automatically and the status is displayed as “CANCELLED” in the Process Monitor Summary page with an error message " Auto-cancellation could be due to Catalog Publish running in parallel".

d. To view the list of published actions, click the **Published** button. The list of published actions is displayed.

   After a Publish action is successful, the User can perform Data Ingestion, view the Catalog Framework and Design pipeline.
   For more information on the Data Ingestion, see Ingesting Data into AFCS Section in the OFS Accounting Foundation Cloud Service Core Functions Guide.

   For more information on Catalog Viewer, see Catalog Viewer Section in the *OFS Data Catalog User Guide*.

   For information on designing and execution of a pipeline, see Designing and Executing Pipelines Section in the *OFS Accounting Foundation Cloud Service Core Functions Guide*.

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Part I
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