CT- STARS

State Analytical Reporting System

OBI- STARS Project Analytics

Facts & Dimensions Job Aid Document

Project Analytics Facts & Dimensions Job Aid

Contents

1. Introduction

The purpose of this job aid is to provide an explanation of dimensional data modeling and the use of dimensions and facts to build analyses within the Project Analytics Subject Areas.

Dimensional Data Model:

The dimensional model is comprised of a fact table and many dimensional tables used for calculating summarized data. Since Business Intelligence reports are used in measuring the facts (aggregates) across various dimensions, dimensional data modeling is the preferred modeling technique in a BI environment.

STARS - OBI data model is based on Dimensional Modeling. The underlying database tables separated as Fact Tables and Dimension Tables. The dimension tables joined to fact tables with specific keys. This data model usually called Star Schema.

The star schema separates business process data into facts, which hold the measurable, quantitative data about the business, and dimensions which are descriptive attributes related to fact data.

Examples of fact data include Budget Amount, Estimate Amount, Cost, and Revenue Amount, etc.

Related dimension attribute examples include Purchase Details, Vendor Details, department, fund, SID, time etc.

Fact Tables:

Fact tables record measurements or metrics for a specific event. Fact tables consist of numeric values and foreign keys to dimensional data where descriptive information is kept. Fact tables are designed to a low level of uniform detail (referred to as "granularity" or "grain"), meaning facts can record events at a very atomic level. This can result in the accumulation of a large number of records in a fact table over time. Fact tables are assigned a surrogate key in ensuring each row uniquely identified.

Dimension Tables:

Dimension tables have a relatively small number of records compared to fact tables, but each record may have a very large number of attributes to describe the fact data. Dimensions can define a wide variety of characteristics, but some of the most common attributes defined by dimension tables include.
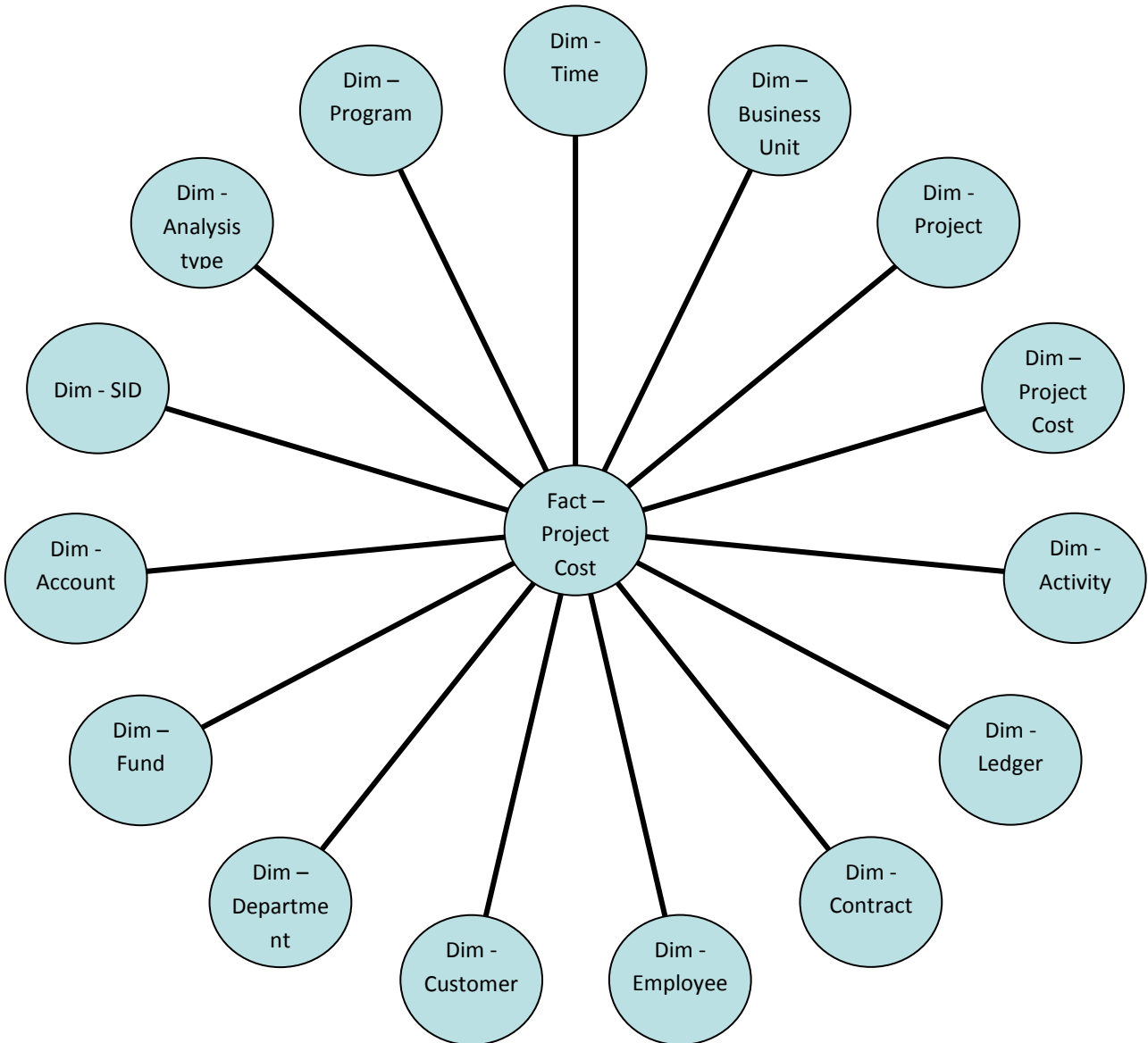
- Time
- Department
- Business Unit

Dimension tables are assigned a surrogate primary key, usually a single-column integer data type, mapped to the combination of dimension attributes that form the natural key.

Star Schema:

Star schemas are optimized for querying large data sets and are used in data warehouses and data marts to support OLAP cubes, business intelligence analytic applications, and ad hoc queries.

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Within the data warehouse or data mart, a dimension table is associated with a fact table by using a foreign key relationship. The dimension table has a single primary key that uniquely identifies each member record (row). The fact table contains the primary key of each associated dimension table as a foreign key. Combined, these foreign keys form a multi-part composite primary key that uniquely identifies each member record in the fact table.

```
                    Dim -
        Dim –       Time         Dim –
       Program                  Business
                                  Unit
  Dim -                                    Dim -
 Analysis                                  Project
   type
                                               Dim –
  Dim - SID                                    Project
                                                Cost
                     Fact –
  Dim -              Project                Dim -
 Account             Cost                   Activity

   Dim –                                       Dim -
    Fund                                       Ledger

      Dim –                              Dim -
    Departme                           Contract
       nt      Dim -       Dim -
              Customer    Employee
```

The Fact Table name in **STARS - OBI** Subject Areas is usually preceded with the name **FACT.** This is done to distinguish the Fact tables from the Dimension Tables.

In the example provided below, the underlying Dimension Tables in this Subject Area are joined to the Fact table to form the star schema.

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Subject Area:

A subject area contains folders; attribute columns (Dimensions) and measure columns (Facts) that represent information about the areas of an organization's business or about groups of users within an organization. Subject areas usually have names that correspond to the types of information that they contain, such as Project Budget & Estimate, Project Commitment, Project Contract, Project Cost etc... There are common **Dimensions Tables** across Financial Subject Areas such as Time, Business Unit, Ledger and Chartfields (Segments). These common Dimensions are followed by Subject Area Specific Dimensions such as Project Cost Details, Project Revenue Details, Project Contract Details and GL Details etc... There are **FACT Tables** across each Subject Areas.
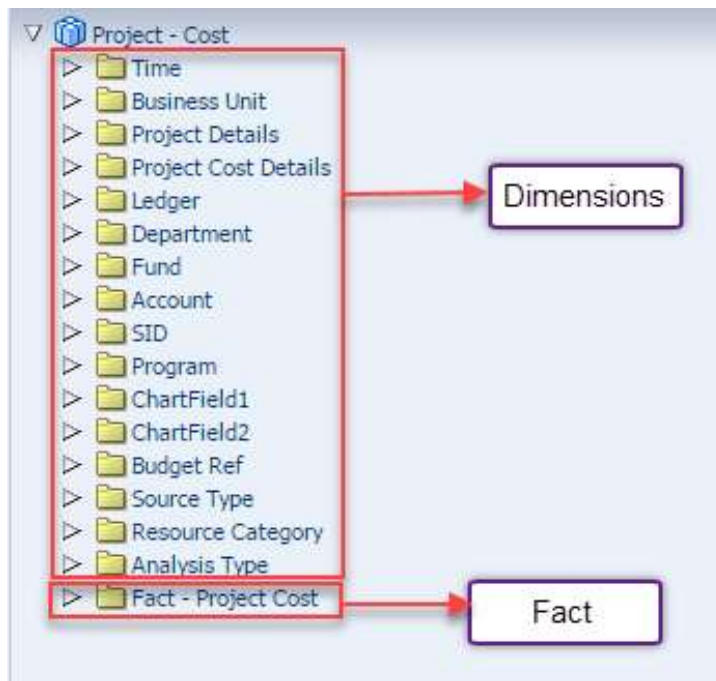
Crossfunctional Drilldown capability from Projects to Other Subject Areas:

When implementing Project Analytics, it has been noticed that it is a common requirement to enable navigation from Projects to sub-ledgers reports/Subject Areas to obtain information on specific transactions using a Linkage key column. One of the main reasons for this is to reconcile Projects to individual subject Areas like GL, AP, PO and Requisitions etc. Crossfunctional drill from project to other subject areas are at detail transaction level.

Linkage Key Column: The purpose of the Linkage columns is to navigate from one Subject area to others, which stores the primary key or unique identifier of a record in the People soft source table. Its often a concatenation of keys

Ex: *GL Transaction ID:* **STATE~AP01520707~20160816~0~150~MOD_ACCRL**
It's a concatenation of BUSINESS_UNIT_GL || '~' || JOURNAL_ID || '~' ||JOURNAL_DATE|| '~' ||UNPOST_SEQ || '~' ||JOURNAL_LINE || '~' ||LEDGER

2. Project Analytics Subject Areas

The Project Analytics is a comprehensive analytics solution that delivers insight into project-based data so all team members can seamlessly track the lifecycle of a project with complete, timely information. Project Analytics provides robust analysis of important project-based data that includes Estimates, budgets, cost, revenue, commitments and Contracts. In addition, Project Analytics is a modular component of integrated to drill cross-functional analysis accounts payables, receivables, and procurement subject areas.

Project Analytics delivers visibility into project performance over the entire lifecycle of a project as well as across projects. As a result all employees, given their level of security can be able to access Project Analytics subject areas.

There are six subject Areas in STARS that represents Project Analytics module in CORE-CT.

- **Project - Budget & Estimate** Subject Area
- **Project - Commitment** Subject Area
- **Project - Cost** Subject Area
- **Project - Revenue** Subject Area
- **Project - Performance** Subject Area
- **Project - Contract** Subject Area

Project - Budget & Estimate: This is a detailed subject area that provides the ability to report on Project Budget and Estimates for the past and current periods including inception-to-date, year-to-date comparisons across project details and Activity along with all related Chartfields. The Analysis types included in this Subject Area are: BD1, HSB and EST.

Drilldown capabilities have been added to Budget

**Project - Commitment**: This is a detailed subject area that provides the ability to report on Project Commitment (Encumbrances and Pre-Encumbrances) across project details and Activity along with all related Chartfields and other attributes like Vendor, Purchase Order details and Requisition details. The Analysis types included in this Subject Area are: CCA, COM, CRV, REQ and RRV.

Drilldown capabilities have been added to PO and Requisitions.

Project - Cost: This is a detailed subject area that provides the ability to report on Cost/Expenditure for the past and current periods including inception-to-date, year-to-date comparisons across project details and Activity along with all related Chartfields and other attributes like Employee, Vendor, Customer, General Ledger details, Account Payables details, Purchase Order details, Time and Labor details and Payroll details.

The Analysis types included in this Subject Area are: ACT, ADD, ADM, APC, BEN, FSP, GLE, HSC, HSE, ICF, ICS, IKE, MSA, SP, PAY and SSP.

Drilldown capabilities have been added to GL, AP, PO, Time & Labor and Payroll.

Project - Revenue: This is a detailed subject area that provides the ability to report on Project Revenue (Billed and Billable) for the past and current periods including inception-to-date, year-to-date comparisons across project details and Activity along with all related Chartfields and other attributes like Employee, Customer, Account Payables details, Purchase Order details, Time and Labor details and Payroll details. The Analysis types included in this Subject Area are: BAJ, BIL, BLD, OLT, UAJ and UTL.

Drilldown capabilities have been added to AP, PO, Time & Labor and Payroll.

Project - Performance: This subject area combines relevant metrics and dimensions from the Budget & Estimate, Cost, Commitments, Revenue subject areas to facilitate creating reports that track Project performance across periods, projects, Activity and various Chartfields.

Project - Contract: This is a detailed subject area that provides the ability to track Awarded Base Amount, Contract Limit Amount, Processed Amount and Excess Amount. You can drill down from Contracts to Project Revenue.

Using Dimensions and Facts to create an analysis:
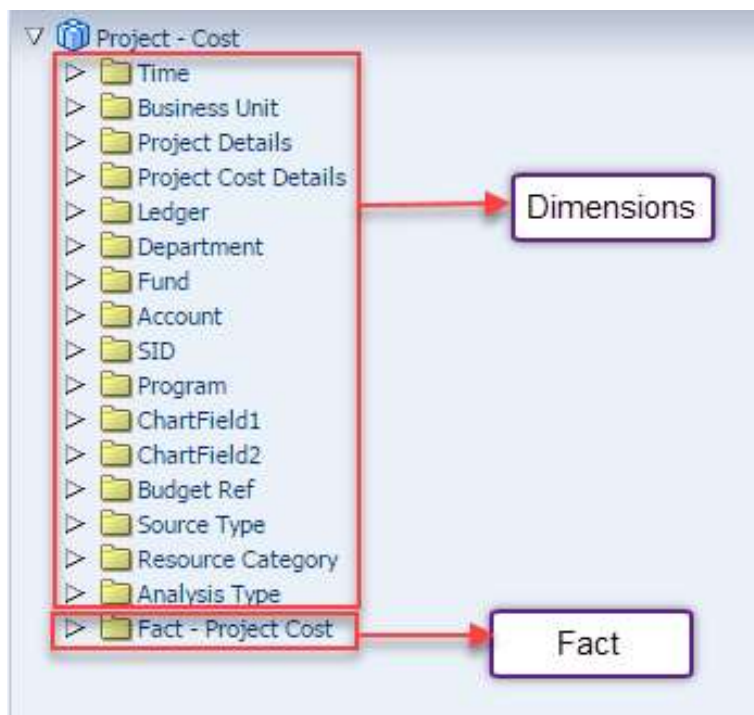
The objects in the left pane are based on database tables in the backend, and the data model behind these subject area tables is dimensional modeling.

The tables listed from Time, Business Unit, Project Cost Details and Analysis Type, etc. are a few of the **Dimension Tables** in this subject area.

There is one Fact table for this Subject Area called **Facts – Project Cost**. The Fact Table name in STARS subject areas is usually preceded with the name **FACT.** This is done to distinguish the Fact tables from the Dimension Tables.

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Here is an example of a **Project – Cost** Subject Area analysis:
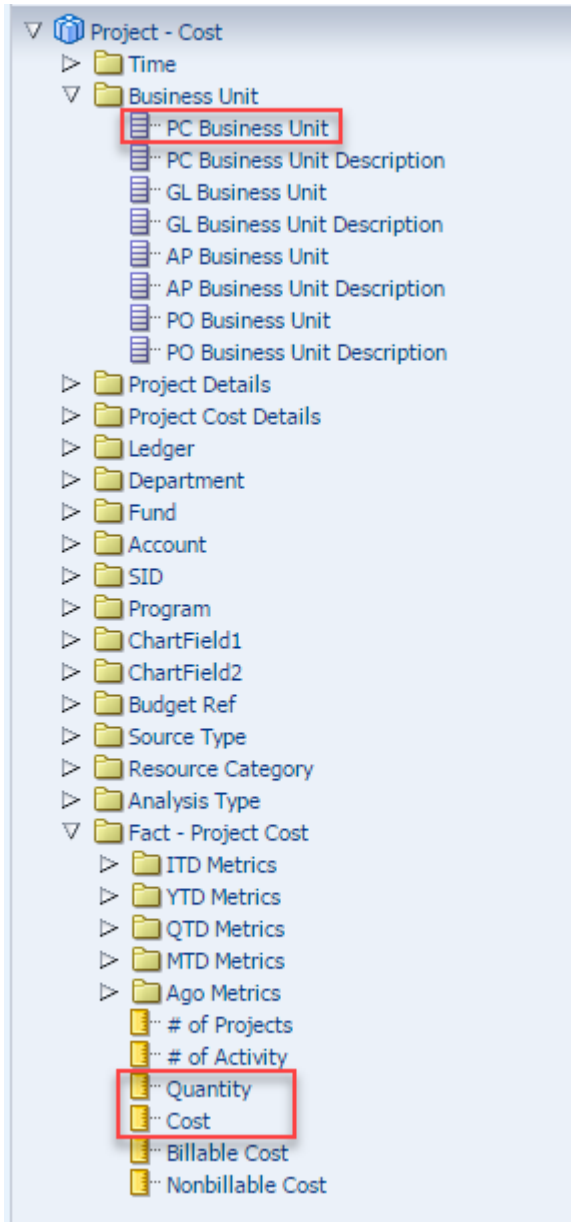
Criteria Tab

Selected Columns

Selected Filters

Results Tab

3. Project - Budget & Estimate Subject Area:

The Project – Budget & Estimate is a detailed subject area that provides the ability to report on Project Budget and Estimates for the past and current periods including inception-to-date, year-to-date comparisons across project details and Activity along with all related Chartfields. The Analysis types included in this Subject Area are: BD1, HSB and EST.
Drilldown capabilities have been added to Budget

Project – Budget & Estimate Subject Area Dimensions
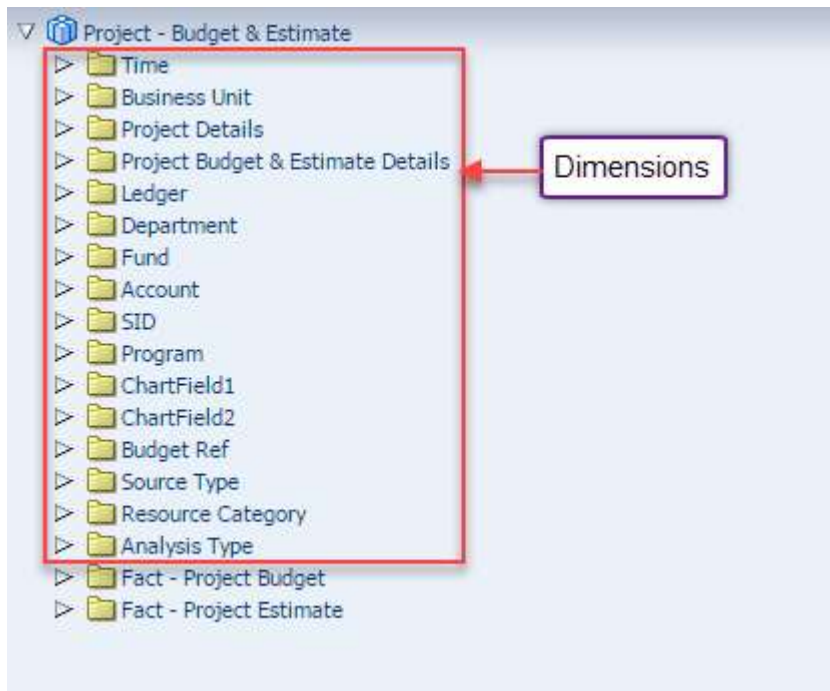
Project – Budget & Estimate Subject Area Facts
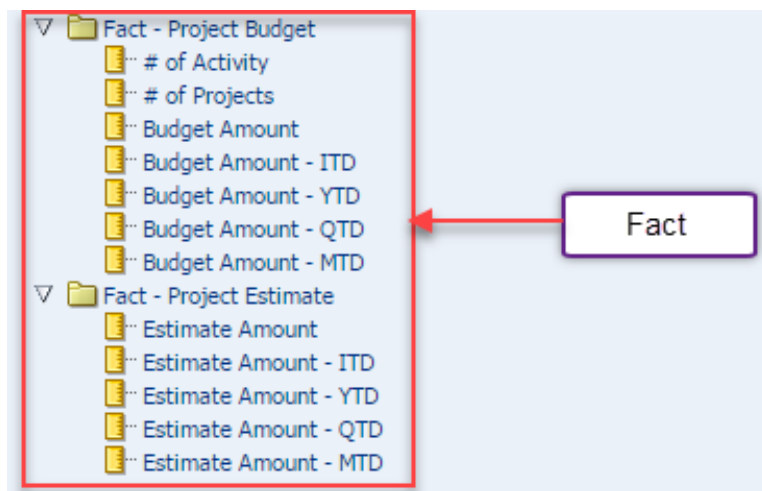
3.1. Fact - Measure Definitions:

Fact – Project Budget:

- **# of Activity:** Number of Distinct Project with Activities.
- **# of Projects:** Number of Distinct Projects with Budgets.
- **Budget Amount:** Its RESOURCE_AMOUNT from PS_PROJ_RESOURCE with Analysis Type IN ('BD1', HSB')
- **Budget Amount - ITD:** Its Inception to date of Budget Amount
- **Budget Amount - YTD:** Its Month to date of Budget Amount
- **Budget Amount - QTD:** Its Quarter to date of Budget Amount
- **Budget Amount - MTD:** Its Year to date of Budget Amount

Fact – Project Estimate:

- **Estimate Amount:** Its RESOURCE_AMOUNT from PS_PROJ_RESOURCE with Analysis Type is 'EST'
- **Estimate Amount - ITD:** Its Inception to date of Estimate Amount
- **Estimate Amount - YTD:** Its Month to date of Estimate Amount
- **Estimate Amount - QTD:** Its Quarter to date of Estimate Amount
- **Estimate Amount - MTD:** Its Year to date of Estimate Amount

When building reports based on Budget & Estimate metrics units such as Budget Amount, Estimate Amt and Budget Amount ITD etc.. by PC Business Unit, use the Project – Budget & Estimate Subject area.

3.2. Crossfunctional Drilldown capability from Project – Budget & Estimate Subject Area:

Drilldown capabilities have been added from *Project – Budget & Estimate* Subject Area to *Financials - Budgetary Control - Detail Transactions* Subject Area using a linkage column *KK Transaction ID.* This Linkage column is in Budgetary Line Details folder under Project Budget & Estimate Details presentation table as shown below.

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Example:

Navigate from Dashboards > Projects on the global header. From the Project Budget Dashboard page, drill to any transaction which drils to the Project Budget Detail report

If you click on any transaction on any *KK Transaction ID* it will navigate from Project budget details to the Financial - Budgetary Control - Detail Transactions subject area

Click on the Analyze link to view *Financial - Budgetary Control - Detail Transactions* Subject area

4. Project - Commitment Subject Area:

This is a detailed subject area that provides the ability to report on Project Commitment (Encumbrances and Pre-Encumbrances) across project details and Activity along with all related Chartfields and other dimensions like Vendor, Purchase Order details and Requisition details. The Analysis types included in this Subject Area are: CCA, COM, CRV, REQ and RRV.

Drilldown capabilities have been added to Purchase Orders and Requisitions.

Project – Commitment Subject Area Dimensions:
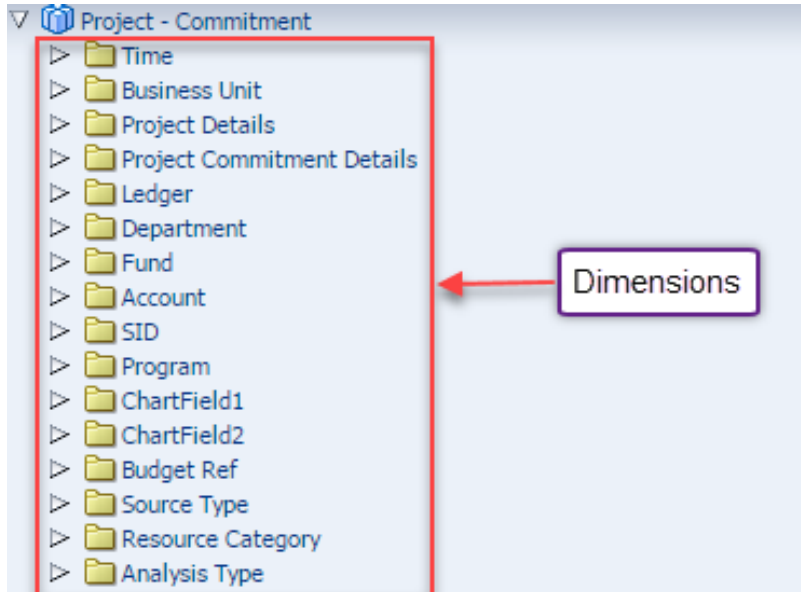
Project – Commitment Subject Area Fact:
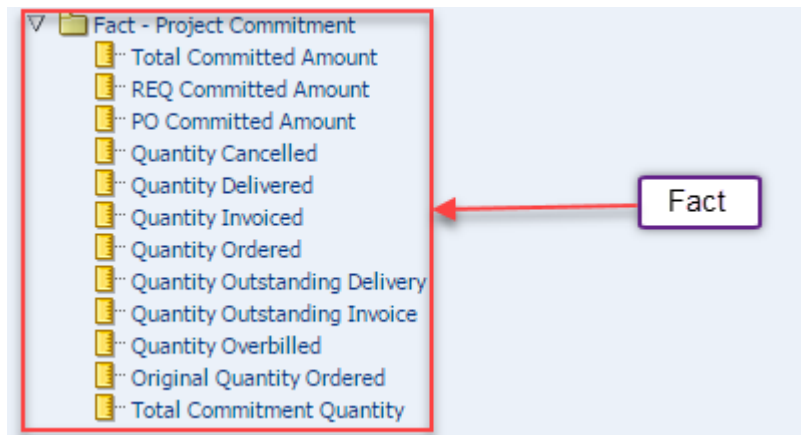
4.1. Fact - Measure Definitions:

- **Total Commitment Quantity:** Total number of units committed. For example, hours of labor committed in a purchase order, purchase requisition

- **Total Commitment Amount:** The sum of commitments from purchase requisitions, purchase orders. Its RESOURCE_AMOUNT from PS_PROJ_RESOURCE table with analysis group IN ('CTENC','CTPRE')
- **REQ Committed Amount:** Purchase requisition commitment cost, and its Commitment Amount USING Commitment Type is 'P'
- **PO Committed Amount:** Its Purchase order commitment cost, and its Commitment Amount USING Commitment Type is 'R'
- **Quantity Cancelled:** Total number of units committed that have been cancelled
- **Quantity Delivered:** Total number of units committed that have been delivered
- **Quantity Invoiced:** Total number of units committed that have been Invoiced
- **Quantity Ordered:** Total number of units committed that have been Ordered
- **Quantity Outstanding Delivery:** Total number of units committed that have not been delivered
- **Quantity Outstanding Invoice:** Total number of units committed that have not been invoiced
- **Quantity Overbilled:** Total number of units committed that have been overbilled
- **Original Quantity Ordered:** Total number of units that have been ordered and are committed

4.2.   Crossfunctional Drilldown capability from Project – Commitment Subject Area:

Drilldown capabilities have been added from *Project – Commitment* Subject Area to *PO* Subject Area using a linkage column *PO Transaction ID.* This Linkage column is present in Purchase Order Details folder under Project Commitment Details presentation table as shown below.
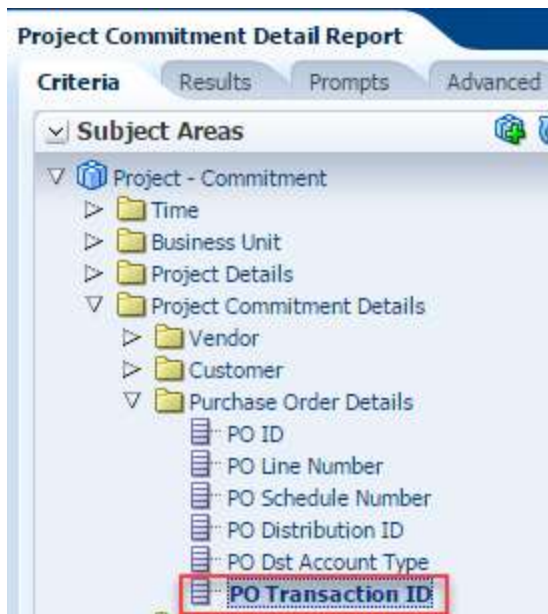
Example:

Navigate from Dashboards > Projects on the global header. From the Project Commitment Dashboard page drill on Project ID on any transaction which drills to the Project Commitment Detail Report

Project Commitment Detail Report

Now click on PO Transaction ID which will navigate from *Project – Commitment* subject area to PO Link Report, which is built using *Procurement and Spend – Purchase Orders* Subject area

Click on the <u>Analyze</u> link to view the *Procurement and Spend – Purchase Orders* subject area

5. Project - Cost Subject Area:

This detailed subject area that provides the ability to report on Cost/Expenditure for the past and current periods including inception-to-date, year-to-date comparisons across project details and Activity along with all related Chartfields and other attributes like Employee, Vendor, Customer, General Ledger details, Account Payables details, Purchase Order details, Time and Labor details and Payroll details.

The Analysis types included in this Subject Area are: ACT, ADD, ADM, APC, BEN, FSP, GLE, HSC, HSE, ICF, ICS, IKE, MSA, SP, PAY and SSP.

Drilldown capabilities have been added to GL, AP, PO, Time & Labor and Payroll.

Project – Cost Subject Area Dimensions:
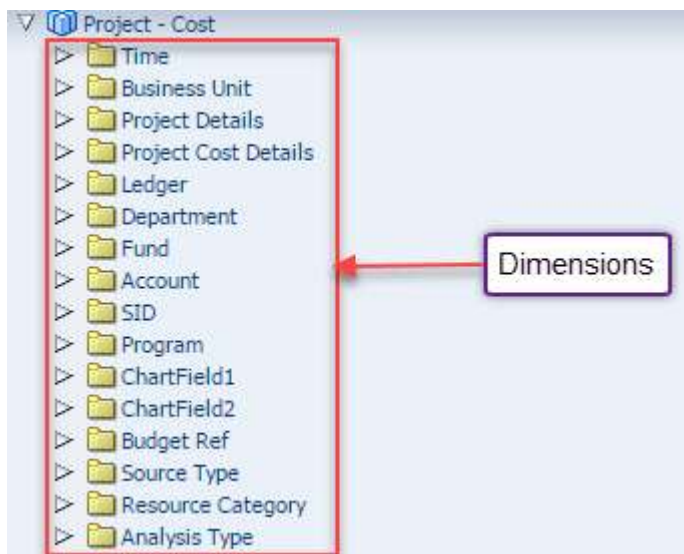
Project – Cost Subject Area Facts:
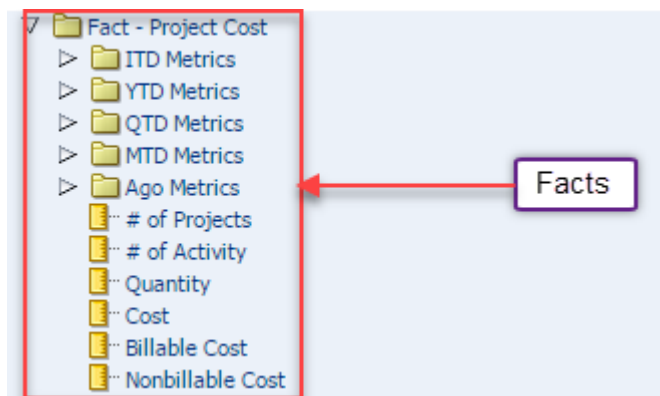
5.1.   Fact - Measure Definitions:

- **# of Projects:** Number of distinct Projects with Cost associated
- **# of Activity:** Number of distinct Activities with Cost associated

- **Quantity:** Quantity of time (example: hours) booked that becomes basis to calculate cost that is directly attributed to work performed
- **Cost:** Its RESOURCE_AMOUNT from PS_PROJ_RESOURCE table with analysis group Is 'ACT'
- **Billable Cost:** Total cost flagged as billable as they result from transactions that are chargeable and activity denoted as billable
- **Nonbillable Cost:** Total cost not flagged as billable because the transactions are not chargeable or the activity where they were performed are not denoted as billable
- **ITD Metrics:** This table contains inception-to-date (ITD) accumulated cost metrics
- **YTD Metrics:** This table contains year-to-date (YTD) accumulated cost metrics
- **QTD Metrics:** This table contains Quarter-to-date (QTD) accumulated cost metrics
- **MTD Metrics:** This table contains month-to-date (MTD) accumulated cost metrics

5.2.   Crossfunctional Drilldown capability from Project – Cost Subject Area:

Drilldown capabilities have been added to *Project – Cost* Subject Area using these linkage columns *GL Transaction ID, AP Transaction ID, PO Transaction ID and TL Transaction ID.* This respective Linkage columns are present in the following folders under Project Cost Details as shown below.

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The above shown Linkage columns that allow users to drill down from P*roject – Cost* Subject Area to *Financials - GL Detail Transactions* Subject Area, *Financials - AP Voucher Line Distrib Details* Subject Area, *Procurement and Spend - Purchase Orders* Subject Area and *Human Resources - Time and Labor* Subject Area.

Note: Drill down from P*roject – Cost* Subject Area to *Human Resources - Time and Labor* Subject Area is possible only for the records with Analysis Type equal to 'PAY'

Example:

Compound Layout:

Compound Layout view allows us to assemble different views for display on a dashboard.

In this example, we displayed the Title and Table views.

Dashboard View:

Click on any Project ID with Analysis Type equal to 'PAY' in order to drill to the Project Cost Detail Report

Voucher ID	Journal ID	Journal Date	Journal Line	PO ID	AP Business Unit	Vendor Number	Vendor Name	AP Transaction ID	PO Transaction ID	TL Transaction ID	GL Transaction ID
0	0		0.00	0	0	Unspecified	Unspecified	0	0	283945~0~03-MAR-16~REG	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	415950~0~03-MAR-16~REG	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	283945~0~03-MAR-16~OVT	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	415950~0~03-MAR-16~FD140	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	283945~0~03-MAR-16~FD016	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	283945~0~03-MAR-16~FD043	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	283945~0~03-MAR-16~FD479	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	415950~0~03-MAR-16~FD016	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	415950~0~03-MAR-16~FD043	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	415950~0~03-MAR-16~FD471	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	283945~0~03-MAR-16~FD139	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	415950~0~03-MAR-16~FD139	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	283945~0~03-MAR-16~FT001	0
0	0		0.00	0	0	Unspecified	Unspecified	0	0	415950~0~03-MAR-16~FT001	0

Click on any TL Transaction ID to navigate to the TL Link Report

Click the Analyze link to view the *Human Resources - Time and Labor* Subject Area

6. Project - Revenue Subject Area:

This is a detailed subject area that provides the ability to report on Project Revenue (Billed and Billable) for the past and current periods including inception-to-date, year-to-date comparisons across project details and Activity along with all related Chartfields and other dimensions like Employee, Customer, Account Payables details, Purchase Order details, Time and Labor details and Payroll details. The Analysis types included in this Subject Area are: BAJ, BIL, BLD, OLT, UAJ and UTL.

Drilldown capabilities have been added to AP, PO, Time & Labor and Payroll.

Project – Revenue Subject Area Dimensions:
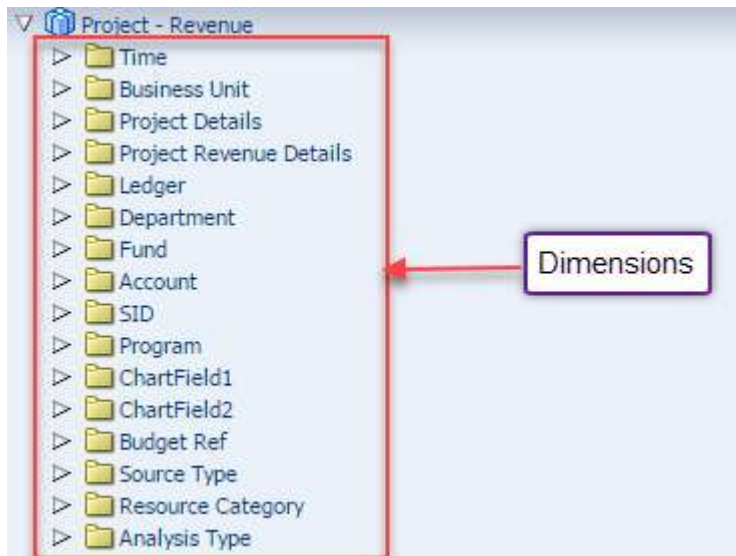
Project – Revenue Subject Area Facts:

6.1. Fact - Measure Definitions:

- **# of Projects:** Number of distinct Projects with a Revenue Distribution Line associated.
- **# of Activity:** Number of distinct Activities with a Revenue Distribution Line associated
- **Revenue Quantity:** Number of Units (of Material or Hours) used for this Revenue Distribution Line
- **Revenue Amount:** Its RESOURCE_AMOUNT from PS_PROJ_RESOURCE table with analysis group Is 'PSREV'

- **Active Contracts Revenue Amount:** Revenue of contract lines with status "Active"
- **ITD Metrics:** This table contains inception-to-date (ITD) accumulated revenue metrics
- **YTD Metrics:** This table contains year-to-date (YTD) accumulated revenue metrics
- **QTD Metrics:** This table contains Quarter-to-date (QTD) accumulated revenue metrics
- **MTD Metrics:** This table contains month-to-date (MTD) accumulated revenue metrics
- **Ago Metrics:** This table contains metrics with values for previous periods, such as Month ago (MAGO), quarter ago (QAGO) and Year ago (YAGO)

6.2.   Crossfunctional Drilldown capability from Project – Revenue Subject Area:

Drilldown capabilities have been added to *Project – Revenue* Subject Area using these linkage columns *AP Transaction ID, PO Transaction ID and TL Transaction ID.* These respective Linkage columns are present in the following folders under Project Revenue Details as shown below.
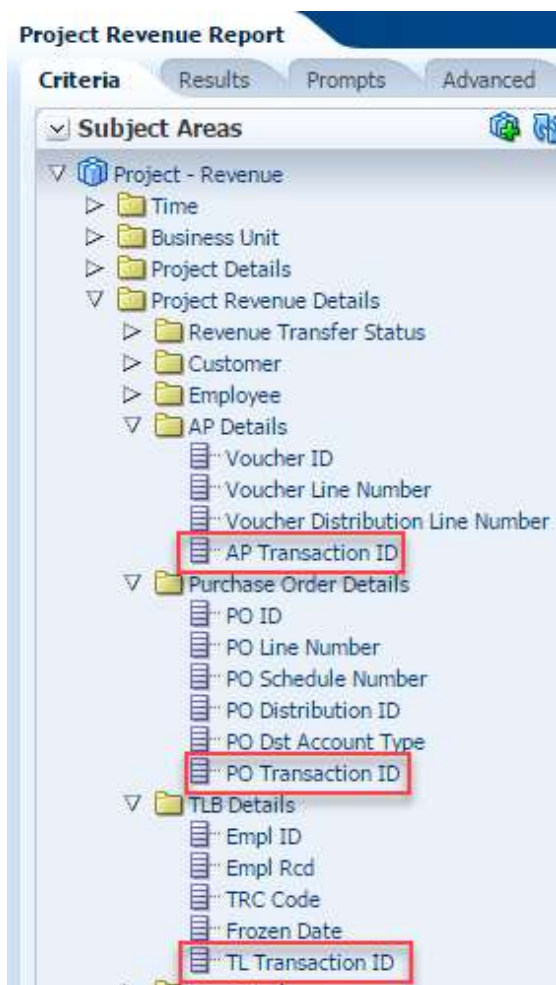
The Linkage columns shown above allow users to drill down from P*roject – Cost* Subject Area to the *Financials - AP Voucher Line Distrib Details* Subject Area, *Procurement and Spend - Purchase Orders* Subject Area and *Human Resources - Time and Labor* Subject Area respectively.

Example:

Compound Layout:

Compound Layout view allows us to assemble different views for display on a dashboard.

In this example, we displayed the Title and Table views.

Dashboard View:

7. Project - Performance Subject Area:

This is a detailed subject area that combines relevant metrics and dimensions from the Budget & Estimate, Cost, Commitments, Revenue subject areas to facilitate creating reports that track Project performance across periods, projects, Activity and various Chartfields.

Project – Performance Subject Area Dimensions:
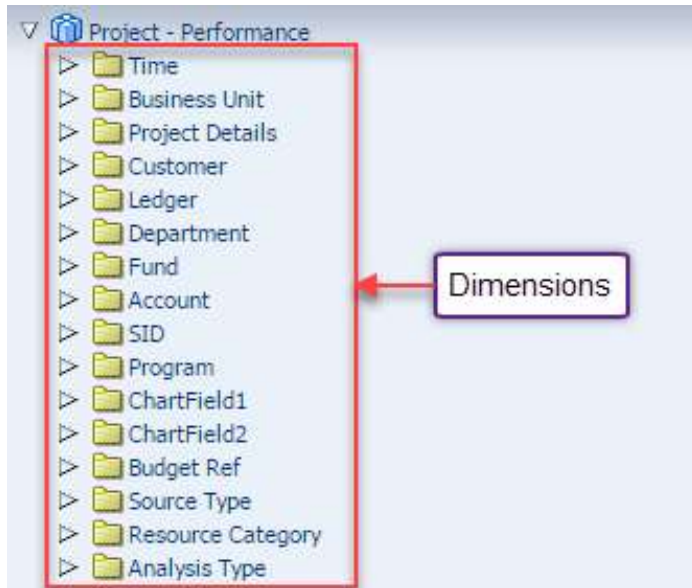
Project – Performance Subject Area Facts:

7.1. Fact - Measure Definitions:

- **Fact – Project Budget:** This table contains metrics for Project Budget and it contains the same metrics that are in Fact – Project Estimate of Project – Budget & Estimate Subject Area.
- **Fact – Project Estimate:** This table contains metrics for Project Estimates and it contains the same metrics that are in Fact – Project Estimate of Project – Budget & Estimate Subject Area.
- **Fact – Project Cost:** This table contains metrics to analyze the actual cost and it contains the same metrics that are in Project – Cost Subject Area
- **Fact – Project Revenue:** This table contains metrics to analyze the amount, status and sources of revenue and It contains the same metrics that are in Project – Revenue Subject Area
- **Fact – Project Commitment:** This table contains the metrics used to report on commitments and it contains the same metrics that are in Project – Commitment Subject Area

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Example:

Compound Layout:

Compound Layout view allows us to assemble different views for display on a dashboard.

In this example, we displayed the Title and Table views.

Dashboard View:

8. Project - Contract Subject Area:

This is a detailed subject area that provides the ability to track Awarded Base Amount, Contract Limit Amount, Processed Amount and Excess Amount. You can drill down from Contracts to Project Revenue.

Project - Contract Subject Area – Dimensions:

Project - Contract Subject Area - Facts:
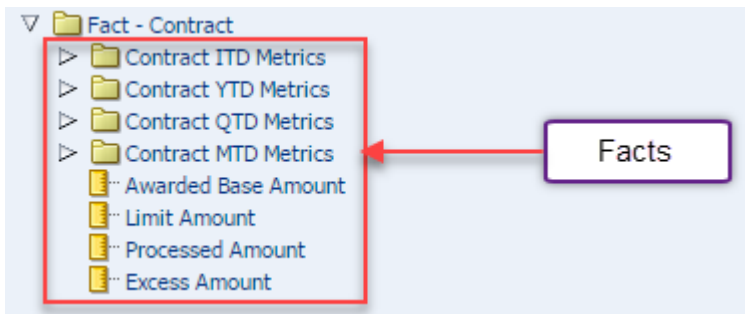
8.1.   Fact - Measure Definitions:

- **Awarded Base Amount:** Its union of
  AWARDED_BASE_AMT from CA_LMT_FEE_DTL table
  and
  LIMIT_AMT_TXN CA_LMT_TXN table
- **Limit Amount:** Its union of
  LIMIT_AMT_BIL from CA_LMT_FEE_DTL table
  and
  LIMIT_AMT_TXN from CA_LMT_TXN table
- **Processed Amount:** Its union of
  LMT_PROC_AMT_B from CA_LMT_FEE_DTL table
  and
  LMT_PROC_AMT_B from CA_LMT_TXN table
- **Excess Amount:** Its union of
  LMT_EXCESS_AMT_B from CA_LMT_FEE_DTL
  and
  LMT_EXCESS_AMT_B from CA_LMT_TXN
- **Contract ITD Metrics:** This presentation table contains inception-to-date (ITD) accumulated Contract metrics

- **Contract YTD Metrics:** This presentation table contains year-to-date (YTD) accumulated Contract metrics
- **Contract QTD Metrics:** This presentation table contains quarter-to-date (QTD) accumulated Contract metrics
- **Contract MTD Metrics:** This presentation table contains month-to-date (MTD) accumulated Contract metrics

Example:

Compound Layout: Compound Layout view allows us to assemble different views for display on a dashboard.

In this example, we displayed the Title and Table views.

Dashboard View:

Project Analytics Facts & Dimensions Job Aid