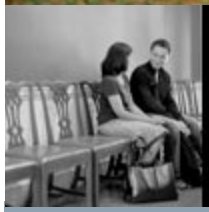

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Enterprise Data Warehouse (EDW) Training For Guam Community College

Susan Shaw, SunGard Higher Education
Banner Performance Reporting and Analytics

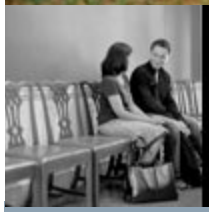
Week of August 15, 2011

Introductions

- Name
- Responsibility at the University
- Involvement with Reporting and ODS/EDW?
- What you hope to get out of the class?

The Week's Agenda

- Introductions
- An EDW Overview
  - Functional
    - Purpose
    - Setup
  - Technical
    - Oracle
    - Reporting from the EDW
- Questions and Answers
- Testing the EDW (Beginning after the training and continuing until complete)



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EDW Overview

EDW Overview

- Content
- Process
  - From the ODS to the Star Schema
    - Data Models
  - From the Star Schema to the Cube
    - Using the Cube
- Administrative Decisions
  - Extract Event Schedules
  - Cleansing setup and processing
- Testing Considerations

EDW Overview

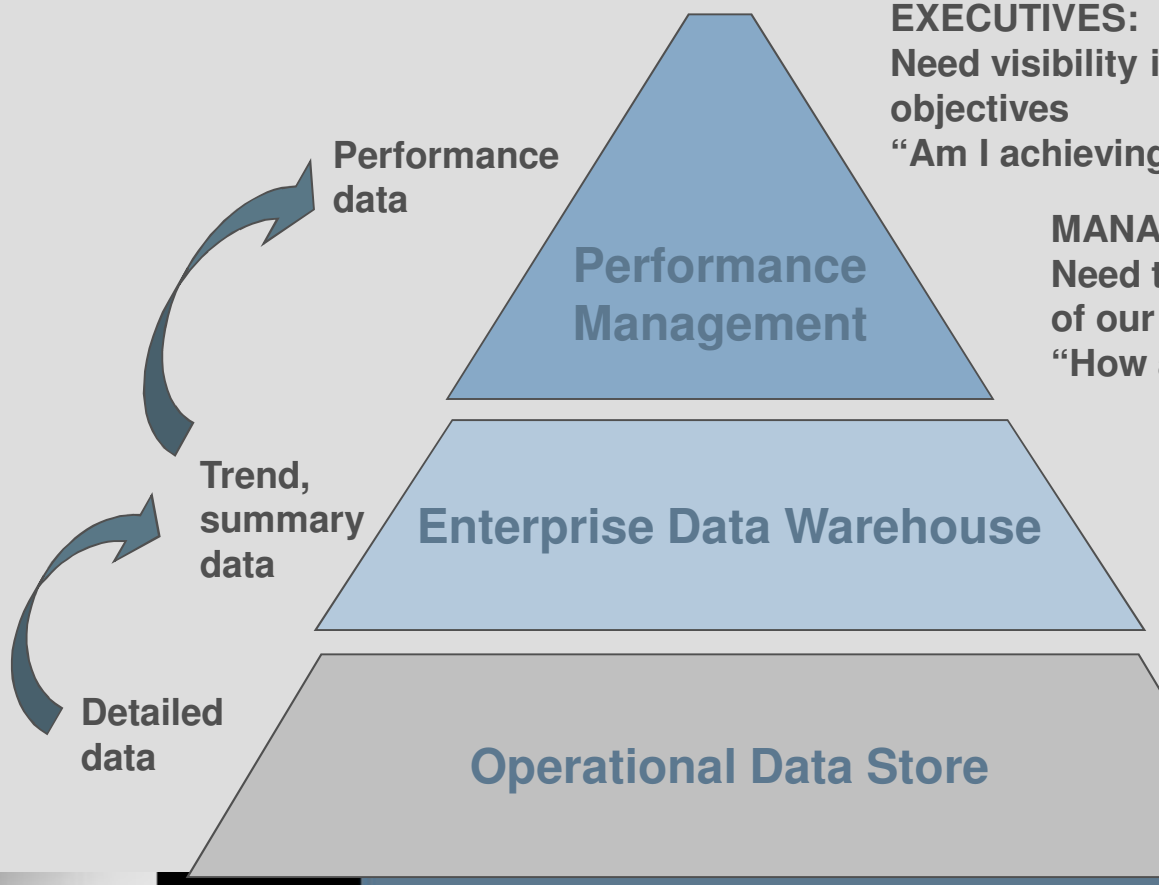
- EDW uses event-based processing to capture point-in-time information for trend analysis and historical reporting.
- The EDW is designed to work with the ODS as a source within the same environment.
- All data ETL activities are performed by Oracle PL/SQL packages generated by OWB.

EDW Overview
Why use the EDW?

- Designed for Higher Education.
- Presents a coherent picture of business conditions at a single point-in-time.
- Provides integrated, reliable information to support the institution's evolving decisions analytics, performance measurement, and management information needs.
- Nonvolatile: once entered into the data warehouse, data should not change.
- Time Variant: focus on change over time.
- Designed to work with the ODS.

EDW Overview
Information Model

- **Information needs to reach all levels of campus**
- **Data from lower levels must be transformed to upper levels**
- **Refined focus on supporting the actual business processes**



EXECUTIVES:
Need visibility into progress towards our goals, objectives
"Am I achieving my goals?"

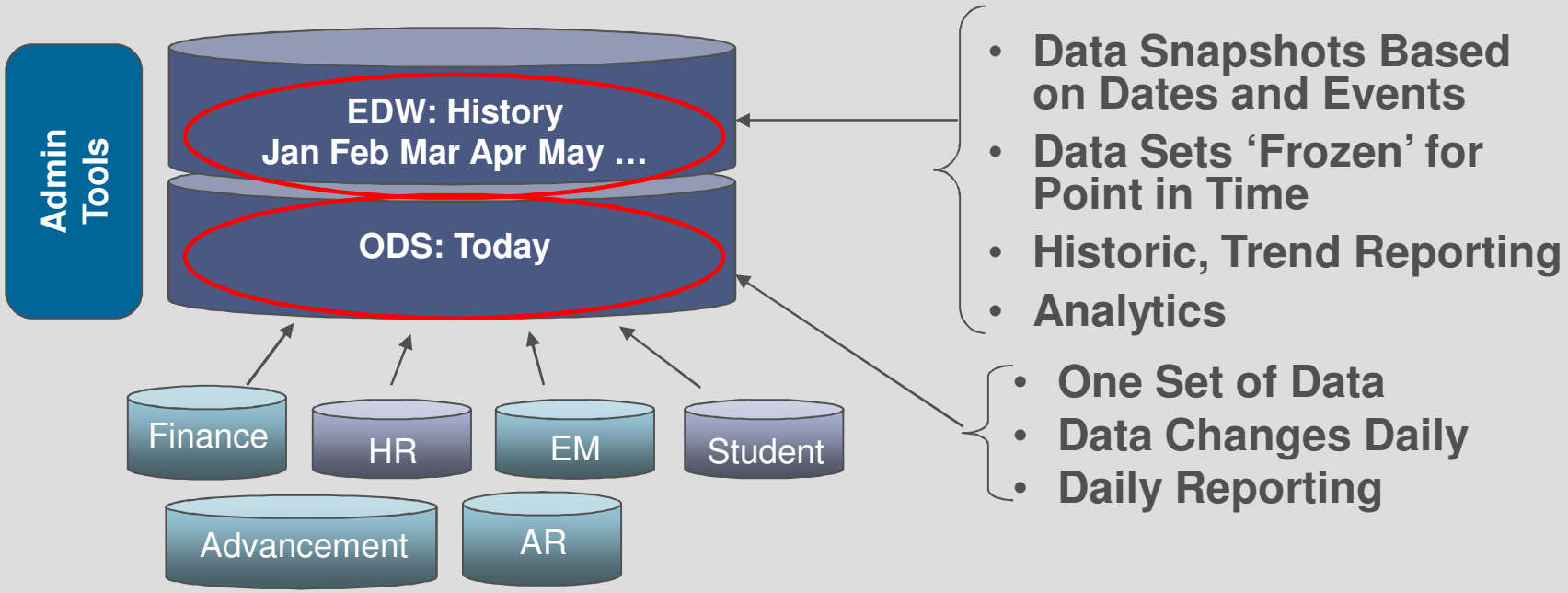
MANAGEMENT:
Need timely trends, summaries, analytics of our operations
"How am I doing?"

KNOWLEDGE WORKERS:
Need to analyze trends and root causes
"Why is this happening?"

STAFF:
Need detailed reports in many formats and ad-hoc access
"What is going on?"
What do I need to do?"

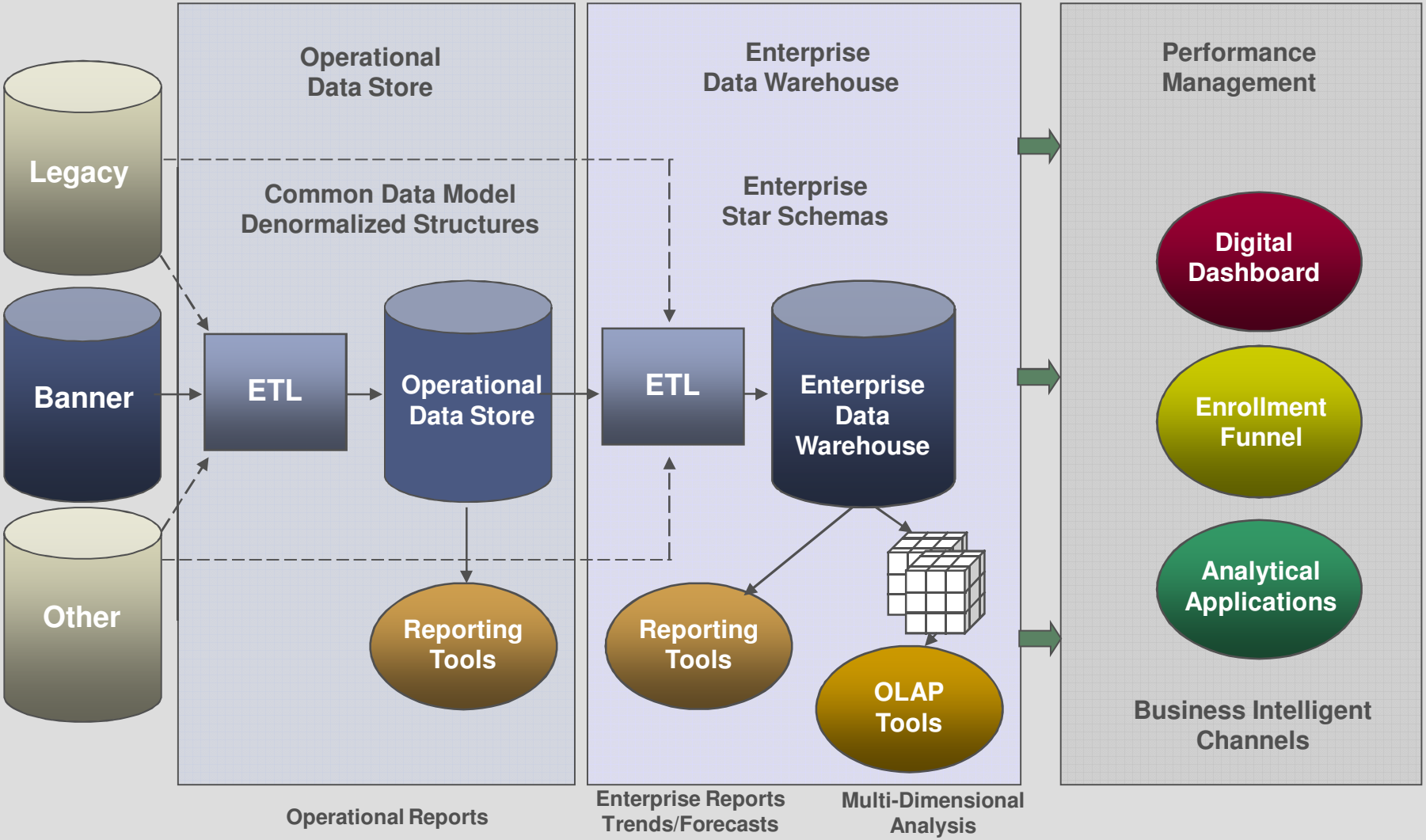
EDW Overview
BPRA Data Warehouse Solution

- **Ensures Consistent Reporting Results**
  - Common Data Source
  - Common Business Concepts
- **Operational Data Store (ODS): Ad-hoc querying and daily reporting**
- **Enterprise Data Warehouse: Historic, trend reporting and analytics**

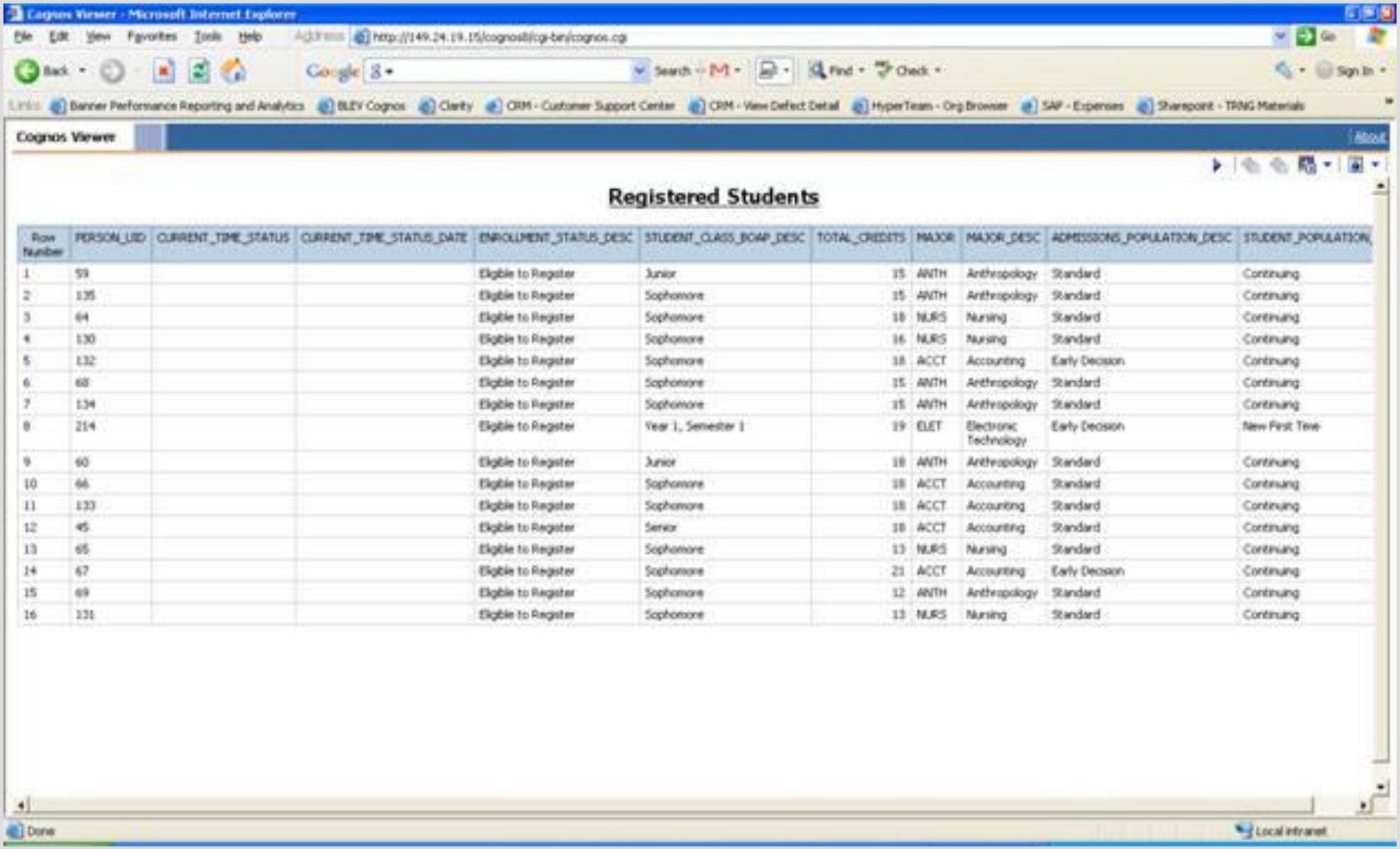


EDW Overview

Performance Reporting and Analytics Architecture

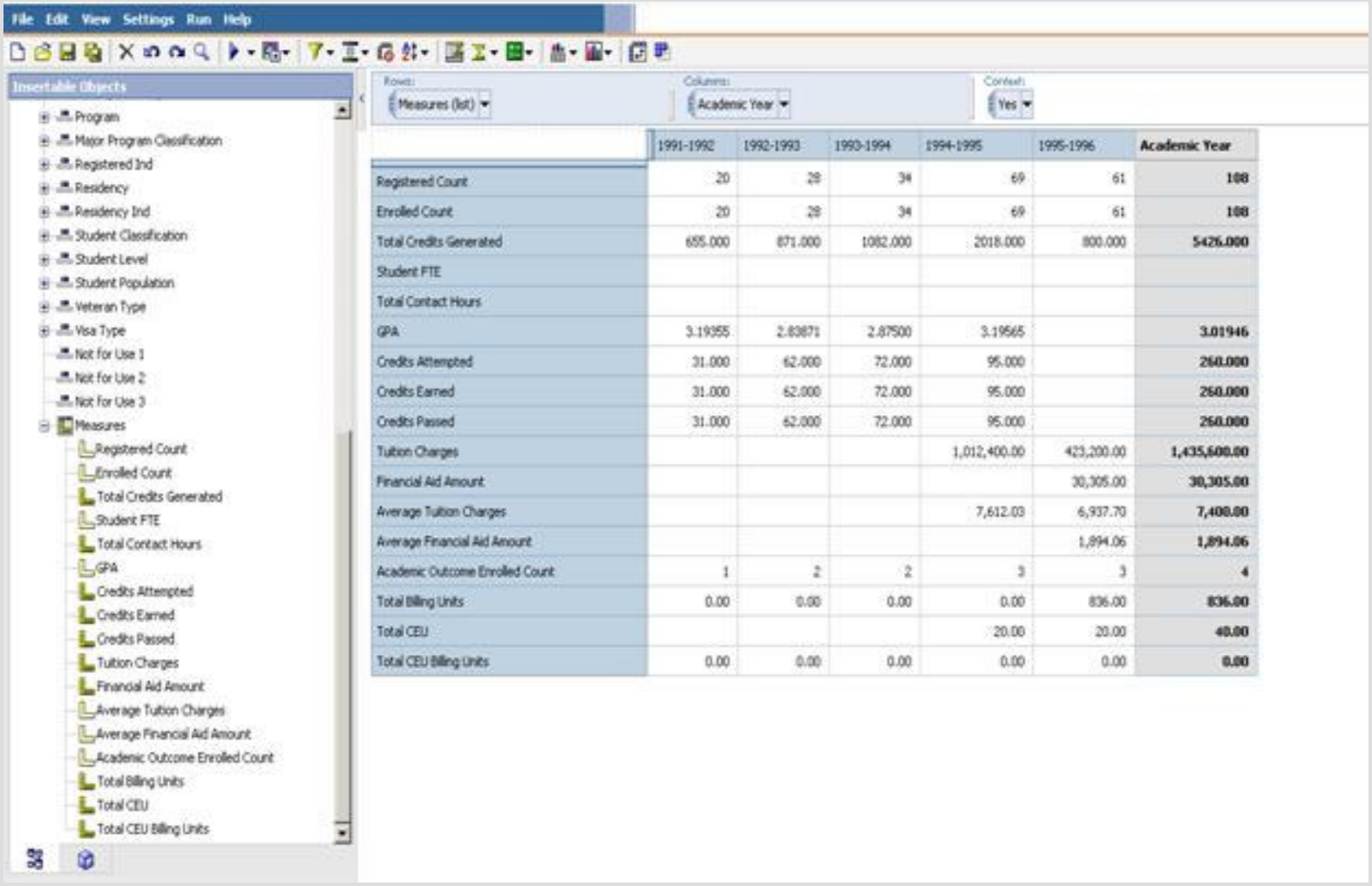


EDW Overview
ODS Report



Row Number	PERSON_UID	CURRENT_TIME_STATUS	CURRENT_TIME_STATUS_DATE	ENROLLMENT_STATUS_DESC	STUDENT_CLASS_BOAP_DESC	TOTAL_CREDITS	MAJOR	MAJOR_DESC	ADMISSIONS_POPULATION_DESC	STUDENT_POPULATION
1	59			Eligible to Register	Junior	15	ANTH	Anthropology	Standard	Continuing
2	135			Eligible to Register	Sophomore	15	ANTH	Anthropology	Standard	Continuing
3	64			Eligible to Register	Sophomore	18	NURS	Nursing	Standard	Continuing
4	130			Eligible to Register	Sophomore	16	NURS	Nursing	Standard	Continuing
5	132			Eligible to Register	Sophomore	18	ACCT	Accounting	Early Decision	Continuing
6	68			Eligible to Register	Sophomore	15	ANTH	Anthropology	Standard	Continuing
7	134			Eligible to Register	Sophomore	15	ANTH	Anthropology	Standard	Continuing
8	214			Eligible to Register	Year 1, Semester 1	19	ELET	Electronic Technology	Early Decision	New First Time
9	60			Eligible to Register	Junior	18	ANTH	Anthropology	Standard	Continuing
10	66			Eligible to Register	Sophomore	18	ACCT	Accounting	Standard	Continuing
11	133			Eligible to Register	Sophomore	18	ACCT	Accounting	Standard	Continuing
12	45			Eligible to Register	Senior	18	ACCT	Accounting	Standard	Continuing
13	65			Eligible to Register	Sophomore	13	NURS	Nursing	Standard	Continuing
14	67			Eligible to Register	Sophomore	21	ACCT	Accounting	Early Decision	Continuing
15	69			Eligible to Register	Sophomore	12	ANTH	Anthropology	Standard	Continuing
16	131			Eligible to Register	Sophomore	13	NURS	Nursing	Standard	Continuing

EDW Overview
EDW Report



	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	Academic Year
Registered Count	20	28	34	69	61	**108**
Enrolled Count	20	28	34	69	61	**108**
Total Credits Generated	655.000	871.000	1082.000	2018.000	800.000	**5426.000**
Student FTE						
Total Contact Hours						
GPA	3.19355	2.83871	2.87500	3.19565		**3.01946**
Credits Attempted	31.000	62.000	72.000	95.000		**260.000**
Credits Earned	31.000	62.000	72.000	95.000		**260.000**
Credits Passed	31.000	62.000	72.000	95.000		**260.000**
Tuition Charges				1,012,400.00	423,200.00	**1,435,600.00**
Financial Aid Amount					30,305.00	**30,305.00**
Average Tuition Charges				7,612.03	6,937.70	**7,400.00**
Average Financial Aid Amount					1,894.06	**1,894.06**
Academic Outcome Enrolled Count	1	2	2	3	3	**4**
Total Billing Units	0.00	0.00	0.00	0.00	836.00	**836.00**
Total CEU				20.00	20.00	**40.00**
Total CEU Billing Units	0.00	0.00	0.00	0.00	0.00	**0.00**

EDW Overview
Data Presentation

Star Schemas

- Dimension tables: used to store unique combination of descriptive attributes
- Fact tables: used to store the measures (amounts, counts, etc.)
- Staging tables: used as temporary storage of extraction information so that it may be manipulated with little or no effect to the actual star models.

Views

- In certain cases a view exists to load the cube rather than loading directly from the tables.

Cubes

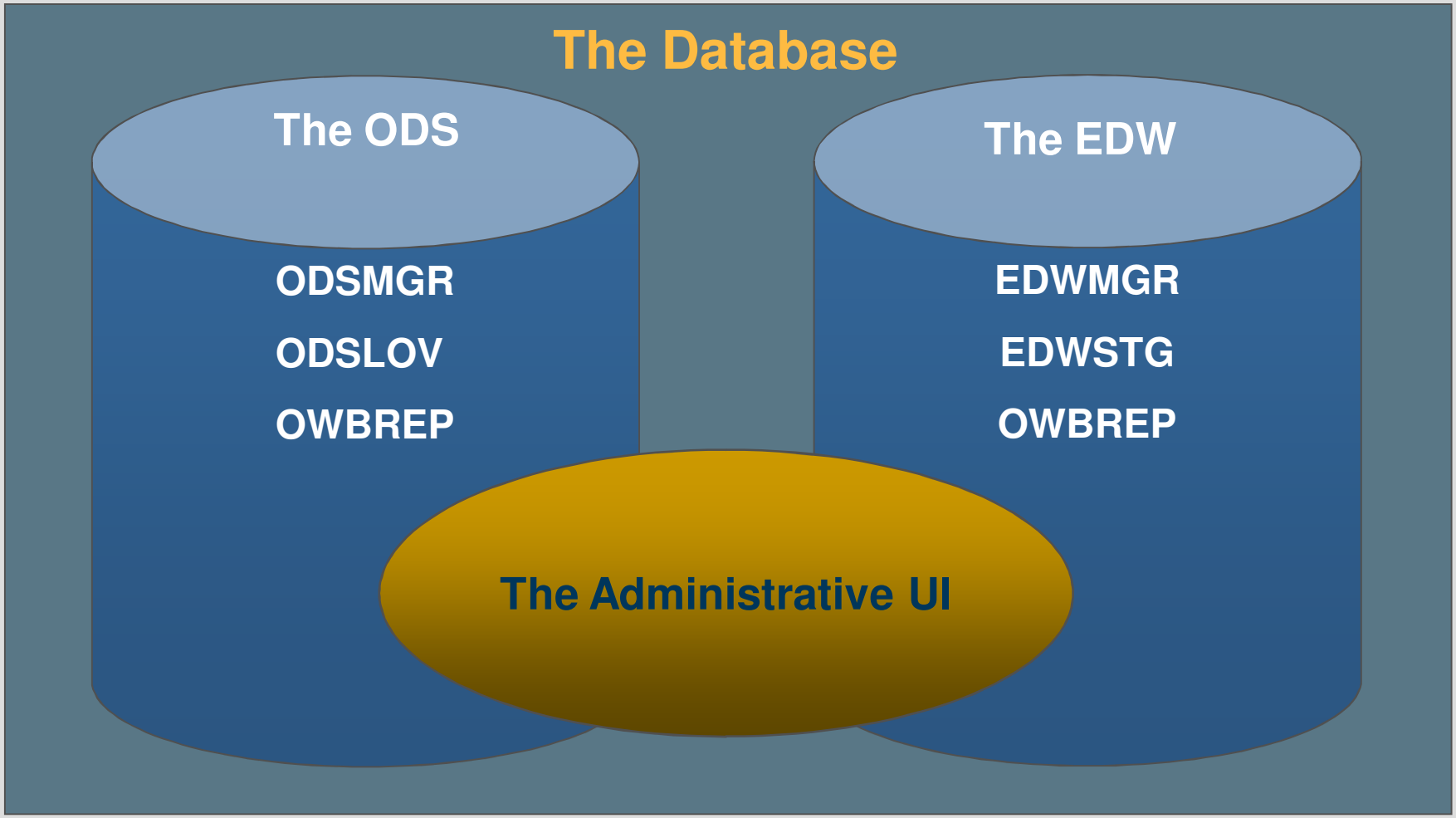
- Stores presorted information that has been aggregated based on an underlying data relationship.

EDW Overview
Subject Content

Advancement	Financial Aid	Accounts Receivables	Financials Management	Human Resources	Student/ Academic
Gift Summary	Pre-student Financial Aid	AR Customer	General Ledger	Employee	Recruiting And Admissions
	Student Financial Aid	AR Revenue	Operating Ledger	Employee Position	Course Registration
			Grants and Projects	Employee Application	Academic Program Course
				Employee Degree	Enrollment
					Graduation Completion

- **Broad Analytics Coverage**
  - Conformed, shared dimensions enable cross-functional analysis
  - Provides best flexibility for satisfying broad, diverse standard and ad-hoc reporting requirements
- **Specifically Designed for Multi-Dimensional Analysis**
  - Star Schemas
  - ** Optional** Cognos FM metadata packages and Analysis Studio cubes
- **Captures Historical Information**
  - Event Snapshots Based on Institutional Business Need
  - Enables Trend Analysis, Forecasting

EDW Overview
Oracle



EDW Overview
Naming Standards

Star Schema Tables (EDWMGR Schema)

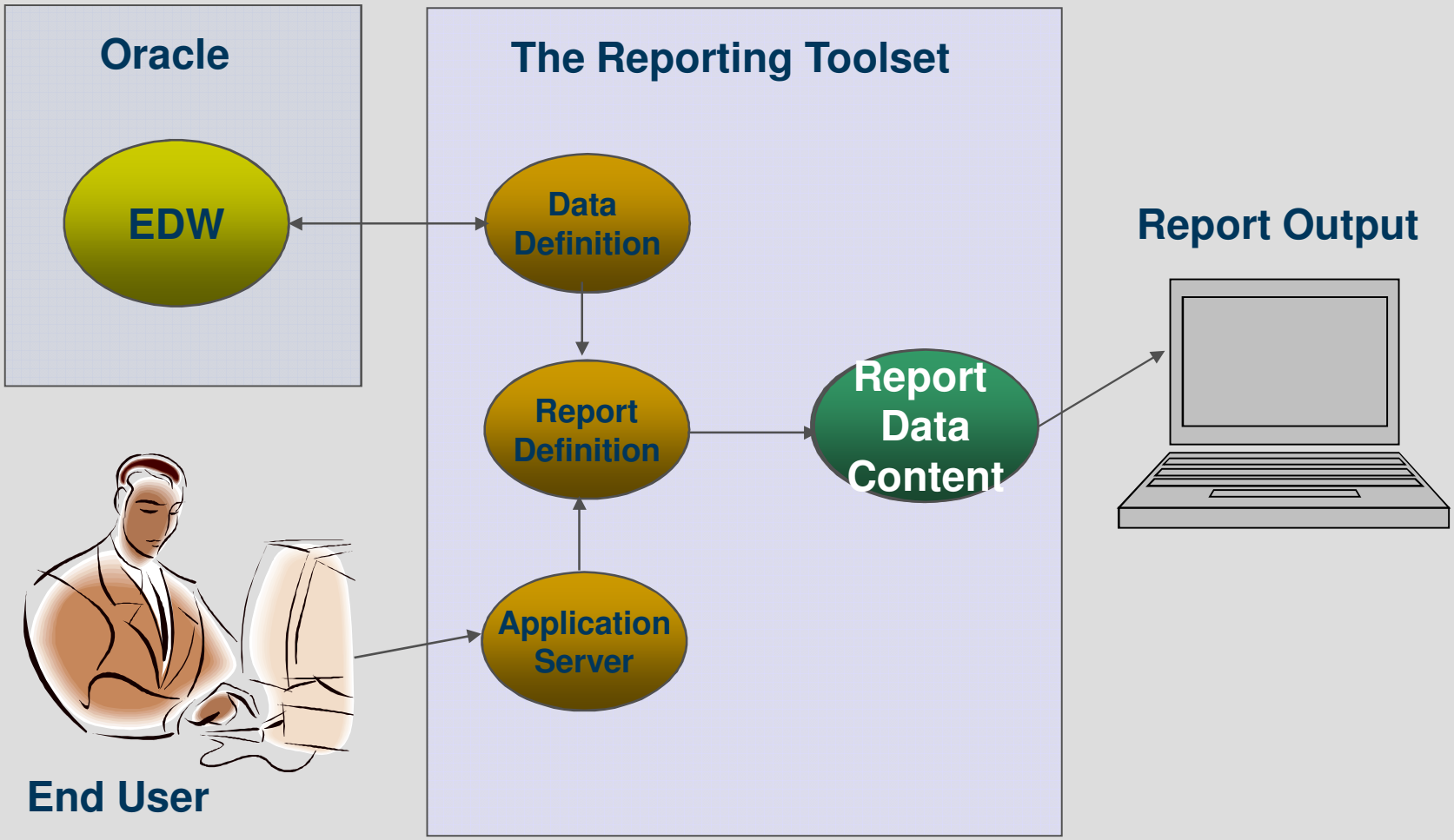
1st Character *W* - Warehouse

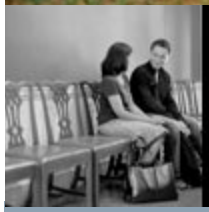
- **2nd Character** *D* – Dimension
  F - Fact
- **3rd Character** *T* - Table
- **4th Character** _ (underscore**)**
- **5-5th-30th Characters** Unique Descriptor

Staging Tables (EDWSTG Schema)

- **1st Character** *W* - Warehouse
- **2nd Character** *T* - Temporary Warehouse Table Type
- **3rd Character** *T* - Table Object Identifier
- **4th Character** _ (underscore**)**
- **5th-30th Characters** Unique Descriptor, ending in any:
  - **_INPUT**
  - **_CLEAN**
  - **_ERROR**
  - **_WKEYS**

EDW Overview
EDW and the Reporting Tool





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Data Warehouse Concepts

Data Warehouse Concepts

- **Source**
  - The ODS (whose source is Banner)
  - Other external data
- **Target**
  - Cleansing control tables
  - Business information process tables
  - Star Schema
  - The Reporting Tool Presentation Environment (Olap Cube)

Data Warehouse Concepts

- **Cleansing**
  - Manage, and build the descriptions associated with codes (Default, Long, and Short)
  - Create new concepts and descriptions (Test Score Ranges, Percentile Ranges, Age)
  - Identify anomalies within the data (a.k.a. data integrity audit, preferably managed in the OLTP system)
- **Extract Events Schedule**
  - Data extracts that are scheduled based on a business need or the volatility of the data.

Data Warehouse Concepts

- **Star Schema**
  - **Fact Table**
    - Contain measures, or numerical information, that are used to perform analysis
  - **Dimension Tables**
    - Contain the attributes, or characteristics that describe observations and their associated measures
  - **Surrogate, or calculated keys**
    - Join fact to dimensions

Data Warehouse Concepts

- **Dimensions**
  - Characteristics of the people, places, or things represented in the data.
  - Stored in dimension tables.
  - One row represents a unique combination of the characteristics .
  - The unique combination is assigned a surrogate (sequential) key.

Data Warehouse Concepts

- **Measures/Facts**
  - Numbers that are related to the attributes by the surrogate key. They generally represent counts, sums, or percentages and other ratios.
  - They may be stored and retrieved.
  - They may be calculated from stored measures as the query is executed.
  - Additive vs. non-additive measures.

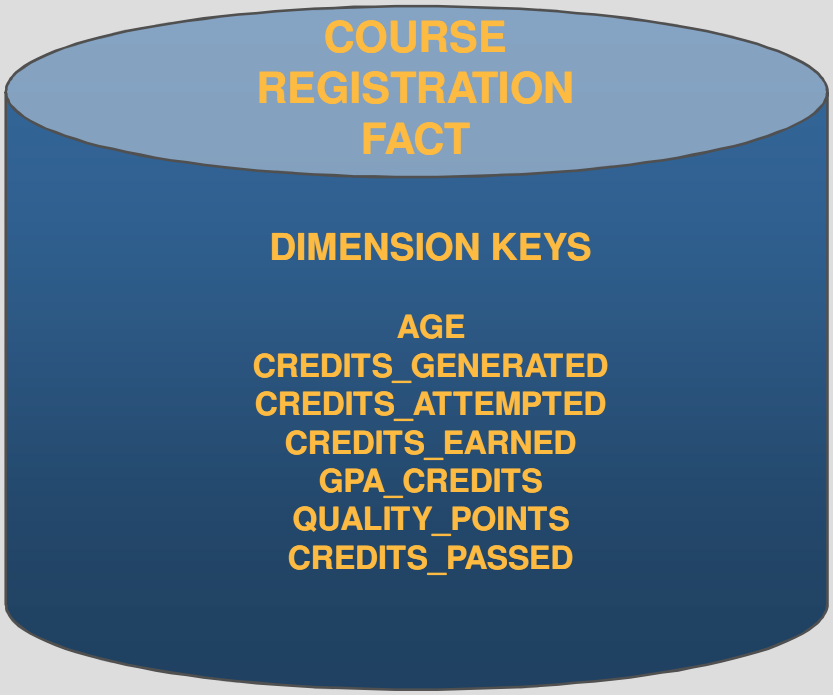
Data Warehouse Concepts

- **Detailed Fact Tables**
  - Store most granular level of detail in the warehouse
  - Support information audit when linked to Banner
- **Summary Fact Tables**
  - Faster responses for queries

Data Warehouse Concepts

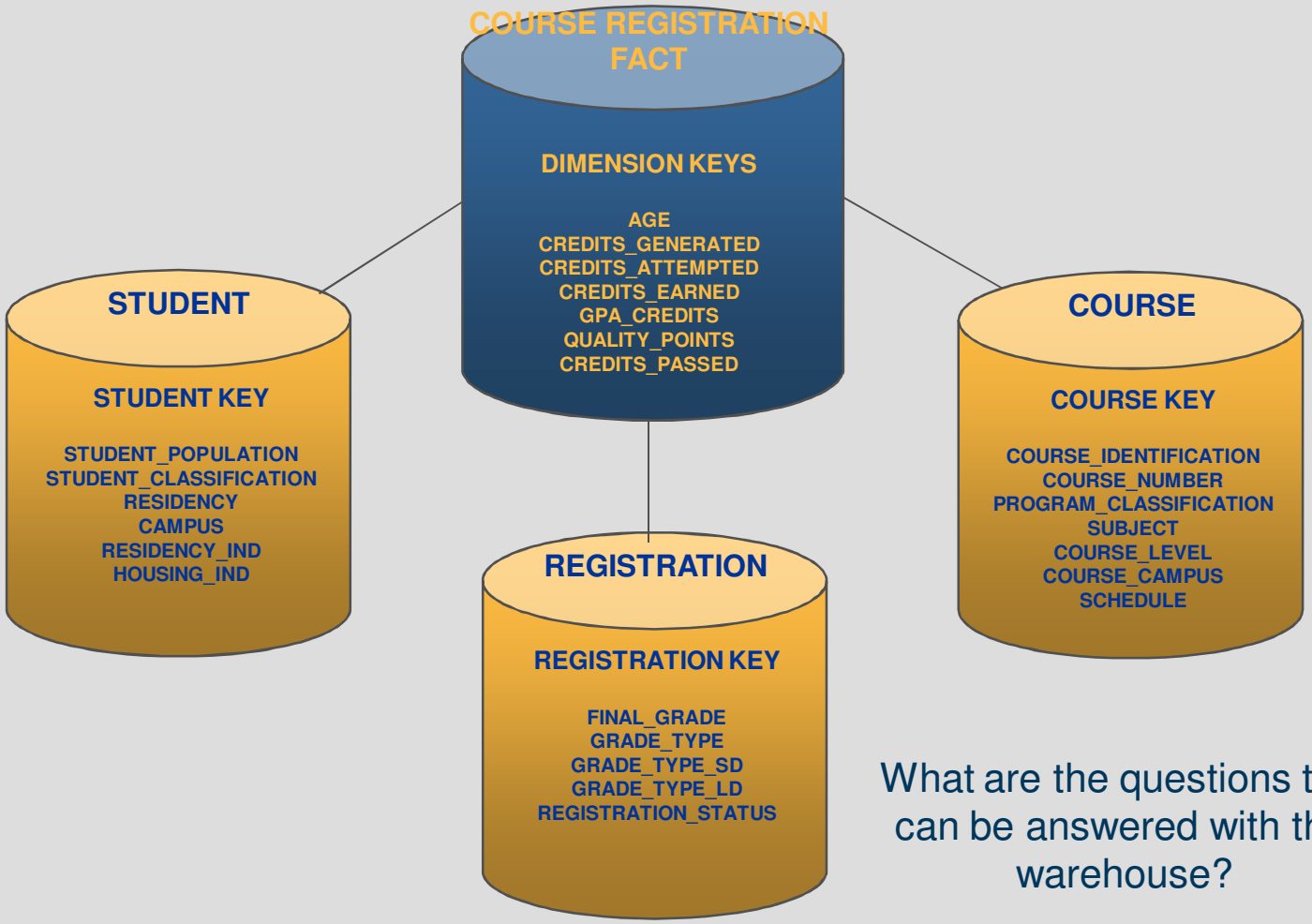
- **Cubes**
  - Multi-dimensional
  - Pre-calculate numbers for all intersections of dimensions
  - Fast – fetching rows
  - Flexibly rigid (Flexible within the confines of its defined dimensions and hierarchies.)

Data Warehouse Concepts
Sample Fact Table



Data Warehouse Concepts
Sample Dimension Table(s)

Data Warehouse Concepts
Fact/Dimension with Perspective



What are the questions that can be answered with this warehouse?

Data Warehouse Concepts
Sample Course Dimension

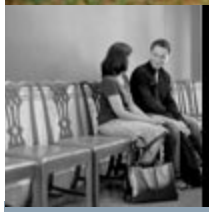
KEY	COURSE IDENTIFICATION	COURSE NUMBER	SUBJECT
1	ELET101	101	ELET
2	ENGL101	101	ENGL
3	ACCT2310	2310	ACCT
4	BIOL1010	1010	BIOL

Data Warehouse Concepts
Sample Student Dimension

KEY	STUDENT POPULATION	CAMPUS	RESIDENCY IND
1	Continuing	M	Y
2	New First Time	M	Y
3	Continuing	M	N
4	New First Time	M	N

Data Warehouse Concepts
Sample Course Registration Fact

TIME_KEY	CRSE_KEY	STUD_KEY	AGE	CREDITS GENERATED
1	1	1	18	15
1	2	1	18	12
1	1	2	23	15
1	3	2	23	15
2	3	1	16	4
2	1	1	27	15
2	1	1	30	12
2	2	1	33	15



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The Star Schema

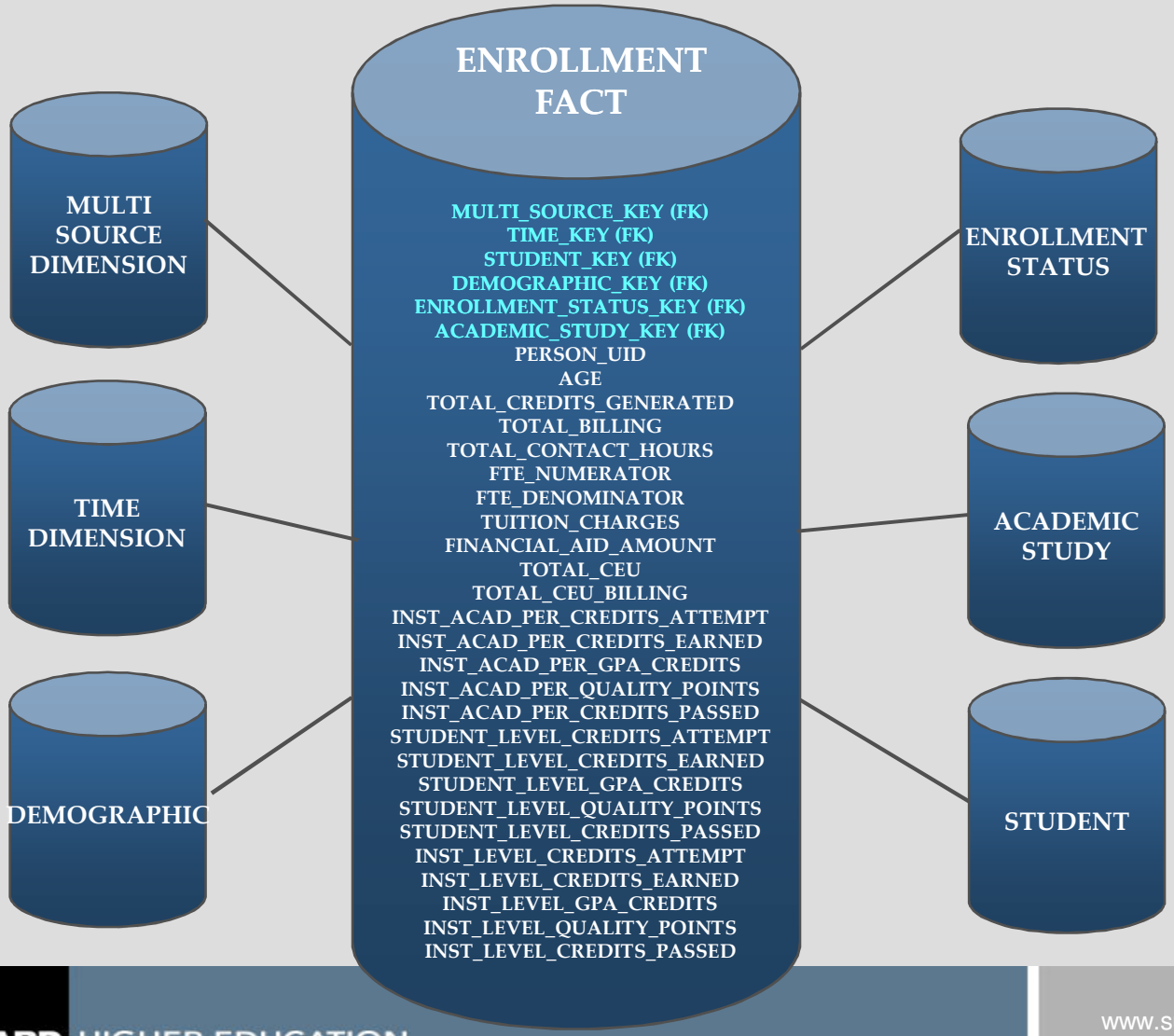
The Star Schema
EDW Snapshot Star Schemas

- STUDENT
  - **ACADEMIC_PROGRAM_COURSE**
  - **COURSE_REGISTRATION**
  - **ENROLLMENT**
  - **GRADUATION_COMPLETION**
  - **RECRUITING_AND_ADMISSION**
- FINANCE
  - **GENERAL_LEDGER**
  - **OPERATING_LEDGER**
  - **GRANT_AND_PROJECT**
- HR
  - **EMPLOYEE**
  - **EMPLOYEE_DEGREE**
  - **EMPLOYEE_POSITION**
  - **EMPLOYMENT_APPLICATION**
- ADVANCEMENT
  - **ADVANCEMENT_GIFT**
- AR
  - **RECEIVABLE_CUSTOMER**
  - **RECEIVABLE_REVENUE**
- FINAID
  - **FINANCIAL_AID_PRE-STUDENT**
  - **FINANCIAL_AID_STUDENT**

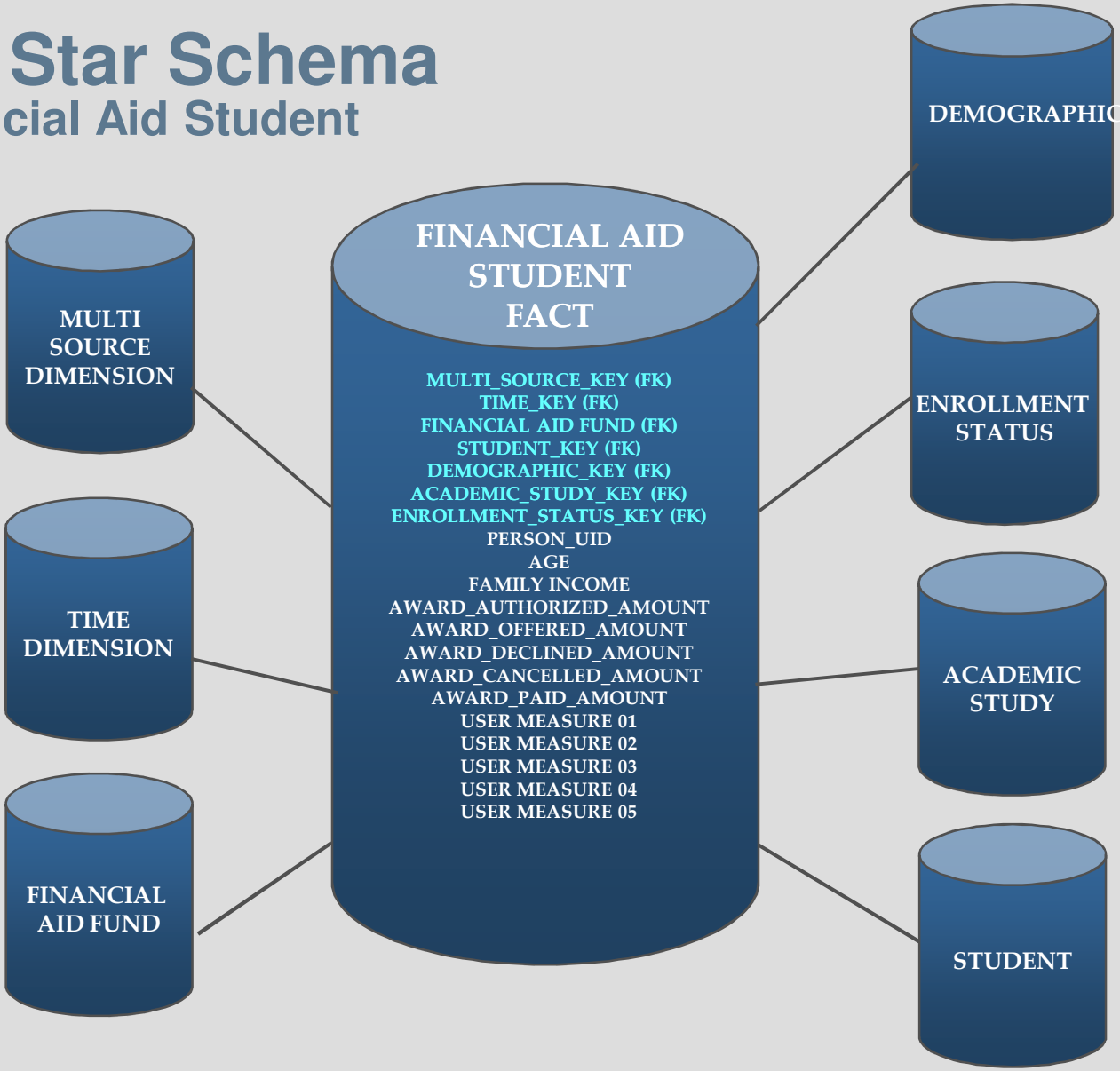
The Star Schema

- **Fact tables**
  - Contain Measures Used to Perform Analysis
- **Dimension Tables**
  - Contain Attributes
  - Surrogate (Calculated) Keys

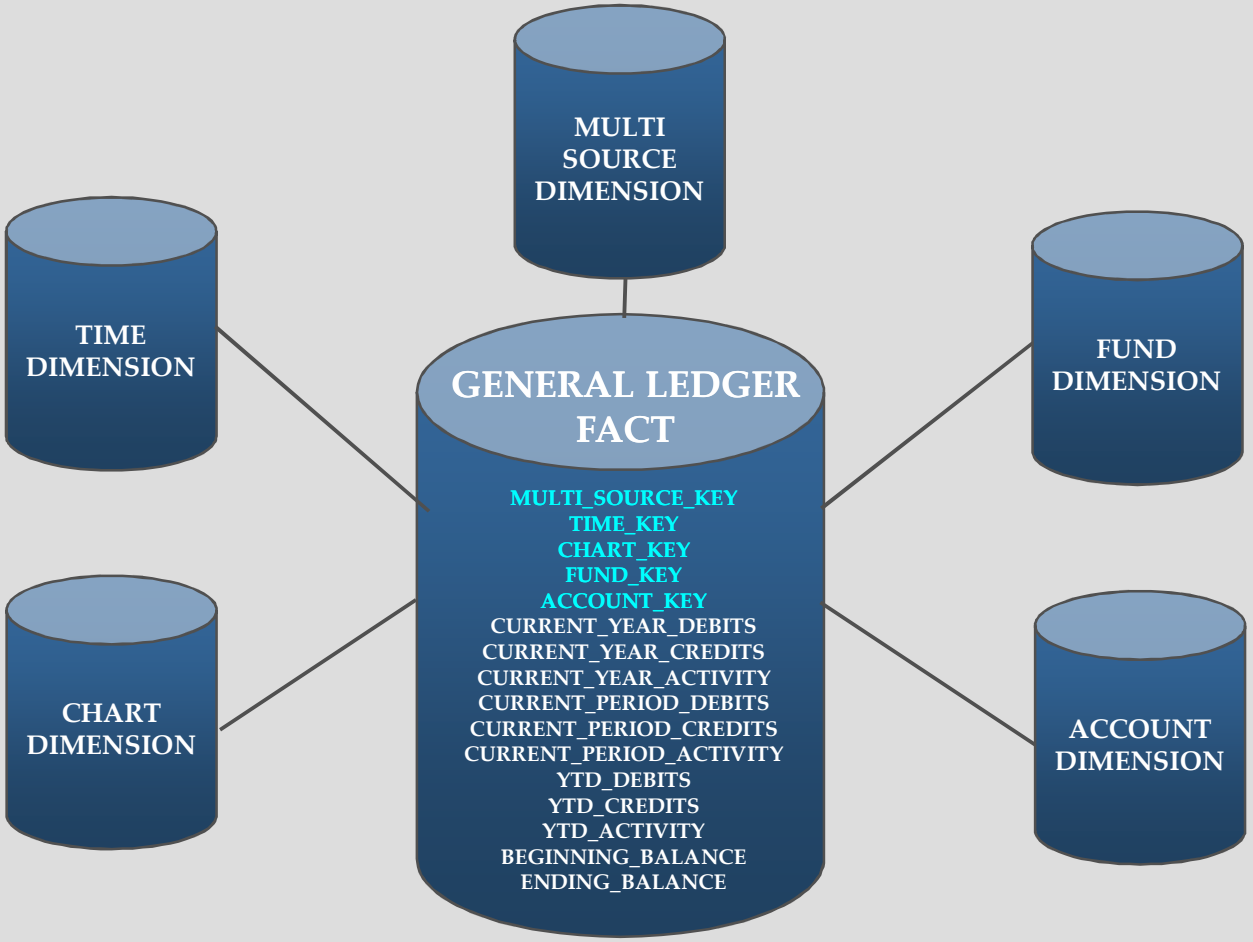
The Star Schema
Enrollment

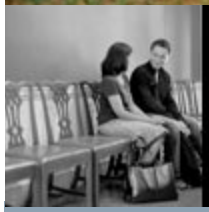


The Star Schema
Financial Aid Student



The Star Schema
General Ledger





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The Event Schedule

The Event Schedule

- Business use focus
- Information volatility focus
- Supports comparison across time

The Event Schedule

- An Event is a logical point in time when you extract information from the ODS and load it into the EDW, essentially freezing the data and giving you a snapshot of the data at that point in time.
  - End of Month
  - Close of Month
  - 1st Day of Class
  - Census Date
  - Nov 1st
- A Final Event is a flag that is set to indicate you are done taking snapshots of the data for that point in time.
  - For example, an academic period in the Enrollment Star, a Calendar Year/Month for the Employee Star.

The Event Schedule
How to determine an Event

- **Data Volatility**

Operational Activities

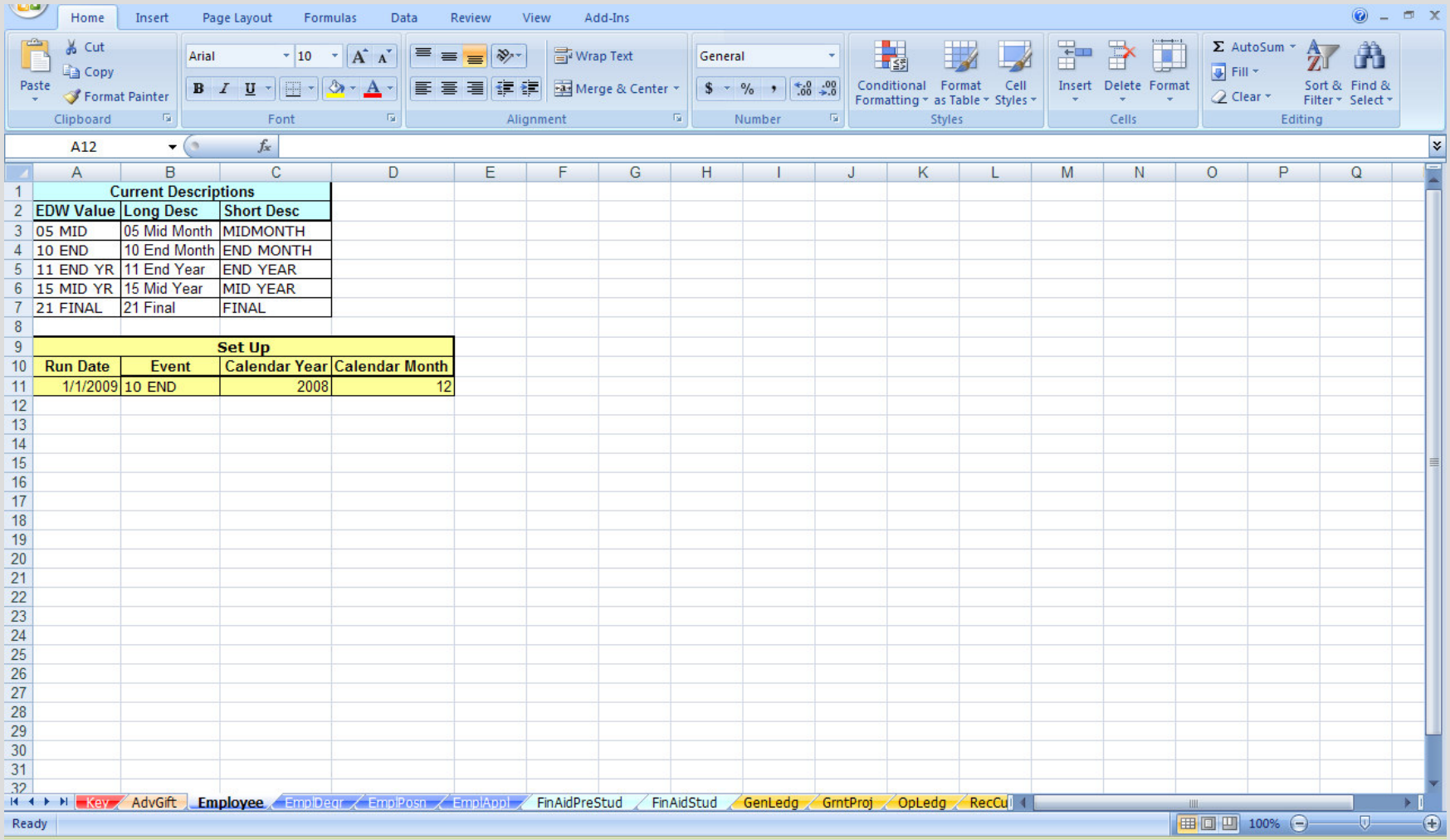
Enrollment
Registration
Pay Event
Finance Posting

- **Business Reason**

Strategic Goals

Strategic Assessment
Accreditation
Federal/State Requirements

The Event Schedule



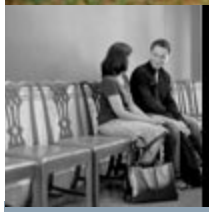
Current Descriptions		
EDW Value	Long Desc	Short Desc
05 MID	05 Mid Month	MIDMONTH
10 END	10 End Month	END MONTH
11 END YR	11 End Year	END YEAR
15 MID YR	15 Mid Year	MID YEAR
21 FINAL	21 Final	FINAL

Set Up			
Run Date	Event	Calendar Year	Calendar Month
1/1/2009	10 END	2008	12

The Event Schedule
Overlapping Events

Registration	Term	Event Schedule	Event Schedule
	Summer 08 Week 1		
	Summer 08 Week 2		
Fall Registration	Summer 08 Week 3	Beginning Registration Fall	
Fall Registration	Summer 08 Week 4	5 Week Before Class	
Fall Registration	Summer 08 Week 5	4 Week Before Class	
Fall Registration	**Break - No Classes**	3 Week Before Class	
Fall Registration	**Break - No Classes**	2 Week Before Class	
Fall Registration	**Break - No Classes**	1 Week Before Class	
Add/Drop	Fall 09 Week 1	Class Week 1	
Add/Drop	Fall 09 Week 2	Class Week 2	
	Fall 09 Week 3	Class Week 3	
	Fall 09 Week 4	Class Week 4	
	Fall 09 Week 5	Class Week 5	
	Fall 09 Week 6	Class Week 6	
	Fall 09 Week 7	Class Week 7	
Winter Registration	Fall 09 Week 8	**Class Week 8**	**Beginning Registration - Winter**
Winter Registration	Fall 09 Week 9	**Class Week 9**	**5 Week Before Class**
Winter Registration	Fall 09 Week 10	**Class Week 10**	**4 Week Before Class**
Winter Registration	**Break - No Classes**		3 Week Before Class
Winter Registration	**Break - No Classes**		2 Week Before Class
Winter Registration	**Break - No Classes**		1 Week Before Class
Add/Drop	Winter 09 Week 1		Class Week 1
Add/Drop	Winter 09 Week 2		Class Week 2
	Winter 09 Week 3		Class Week 3
	Winter 09 Week 4		Class Week 4
	Winter 09 Week 5		Class Week 5
	Winter 09 Week 6		Class Week 6
	Winter 09 Week 7		Class Week 7
Spring Registration	Winter 09 Week 8	**Beginning Registration Spring**	**Class Week 8**
Spring Registration	Winter 09 Week 9	**5 Week Before Class**	**Class Week 9**
Spring Registration	Winter 09 Week 10	**4 Week Before Class**	**Class Week 10...**
Spring Registration	**Break - No Classes**	3 Week Before Class	
Spring Registration	**Break - No Classes**	2 Week Before Class	
Spring Registration	**Break - No Classes**	1 Week Before Class	
Add/Drop	Spring 09 Week 1	Class Week 1	
Add/Drop	Spring 09 Week 2	Class Week 2	
	Spring 09 Week 3	Class Week 3	
	Spring 09 Week 4	Class Week 4	
	Spring 09 Week 5	Class Week 5	
	Spring 09 Week 6	Class Week 6	
	Spring 09 Week 7	Class Week 7	
	Spring 09 Week 8		
	Spring 09 Week 9		
	Spring 09 Week 10		

Overlap of Events



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The Administrative UI

More of the Details

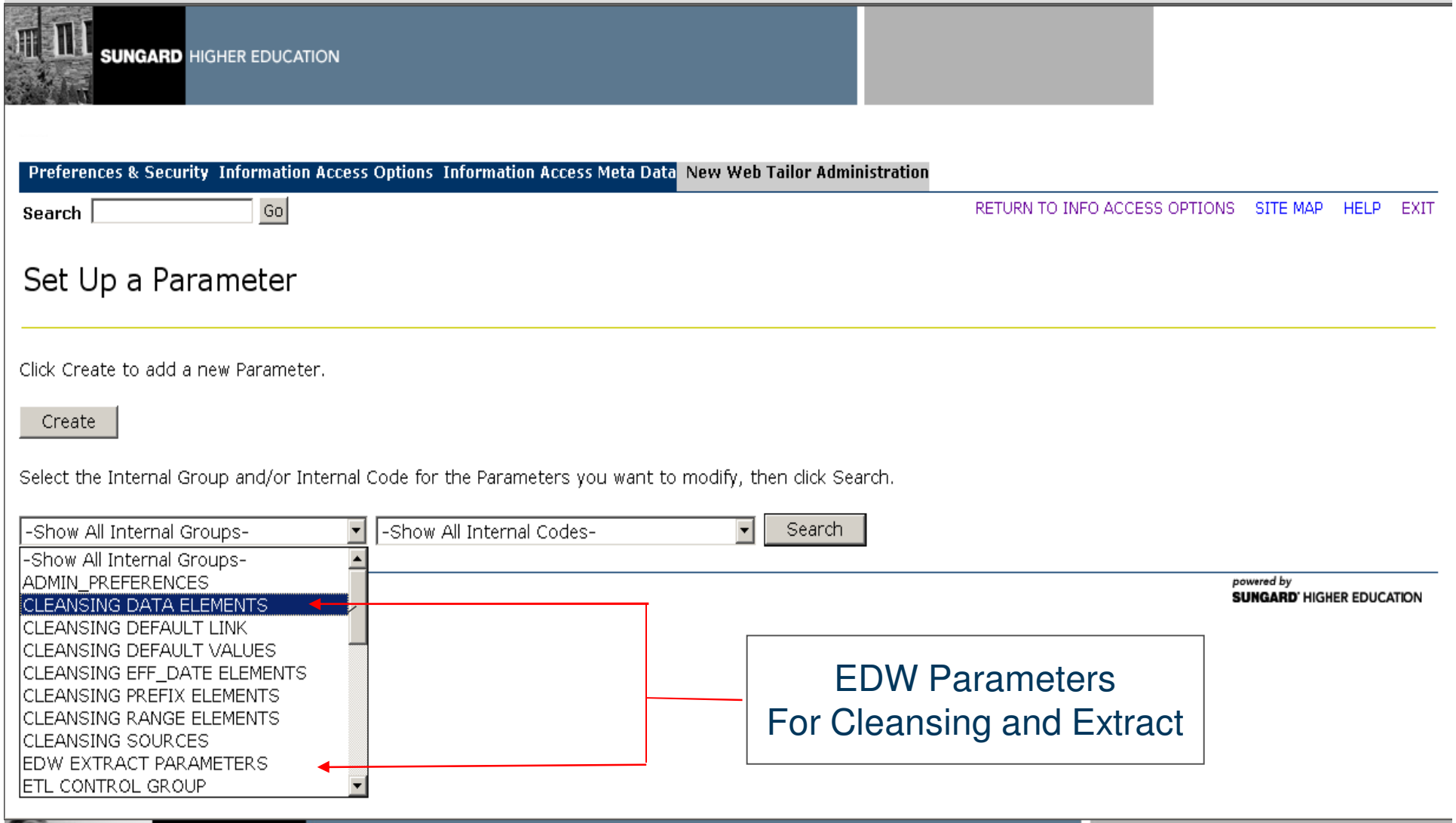
The Administrative UI

- **Execute and Monitor Processes**
  - Load Processes
  - Checks and Balances
  - Error Correction Processes
  - Load Data Cleansing Values
- **Cleansing Maintenance**
  - Define Default Values
  - Maintain Descriptions
  - Translate Codes from Source Values
- **View and Maintain Meta Data**
- **Security**
  - Fine-Grained Access

The Administrative UI

- **EDW Metadata**
  - Baseline EDW metadata
  - EDW stars
  - Maintain EDW metadata

The Administrative UI
Set up parameters



The Administrative UI
Set up parameters

Cleansing Data Elements

- Information Access uses this parameter during the cleansing process when building the dimension tables for the EDW star schemas.
- This parameter defines the Data Elements that exist within each dimension.
- The elements listed here are what show up in the drop-down lists for cleansing description and code value screens.

Cleansing Default Link

- The Information Access uses this parameter to set up links between Data Elements and ODS values which are used to load default cleansing translations and descriptions.

The Administrative UI
Set up parameters

Cleansing Default Values

- Define the value, and long and short descriptions, used in the EDW for NULL and BAD (i.e. value not found in cleansing values list) cleansing values.

Cleansing Prefix Elements

- Information Access uses this parameter during the cleansing process to determine when to combine the values of one data element with the values of another data element as a prefix.
- This concept is most used in the area of finance where you want to look at all values of some data elements (fund, account, organization) across all values of your charts of accounts.

The Administrative UI
Set up parameters

Cleansing Range Elements

- Distinct values from the source system that are combined into a range of values in Banner EDW.
- For example, salaries are stored in a range of values so that you can group employees by salary categories. If an employees annual salary is 75,550, the value gets cleansed and stored in the salary range value 70000 - 79999.99

Cleansing Sources

- Use to find the cleansing rules for a specific source system. It defines the data sources to Banner EDW.

Cleansing Eff_date Elements

- Not currently used

The Administrative UI
Set up parameters

EDW Extract Parameters

- This parameter is used to populate the EDW. It helps to control how certain EDW extracts operate when moving information from the ODS to the EDW.
  - EARNINGS - includes values for Earnings that let you group your institution's earning codes into one of three categories: regular, overtime and other. The Earnings parameter values are used by the Load EDW Employee and Load EDW Employee Position jobs to group earning information before loading it into the EDW.
  - HR_APPL_STAT
  - Student Groups—STUDENT_LEVEL_GROUP, STUDENT_LEVEL_GROUP_TEST, TEST

The Administrative UI
Schedule a process

Schedule EDW Mappings

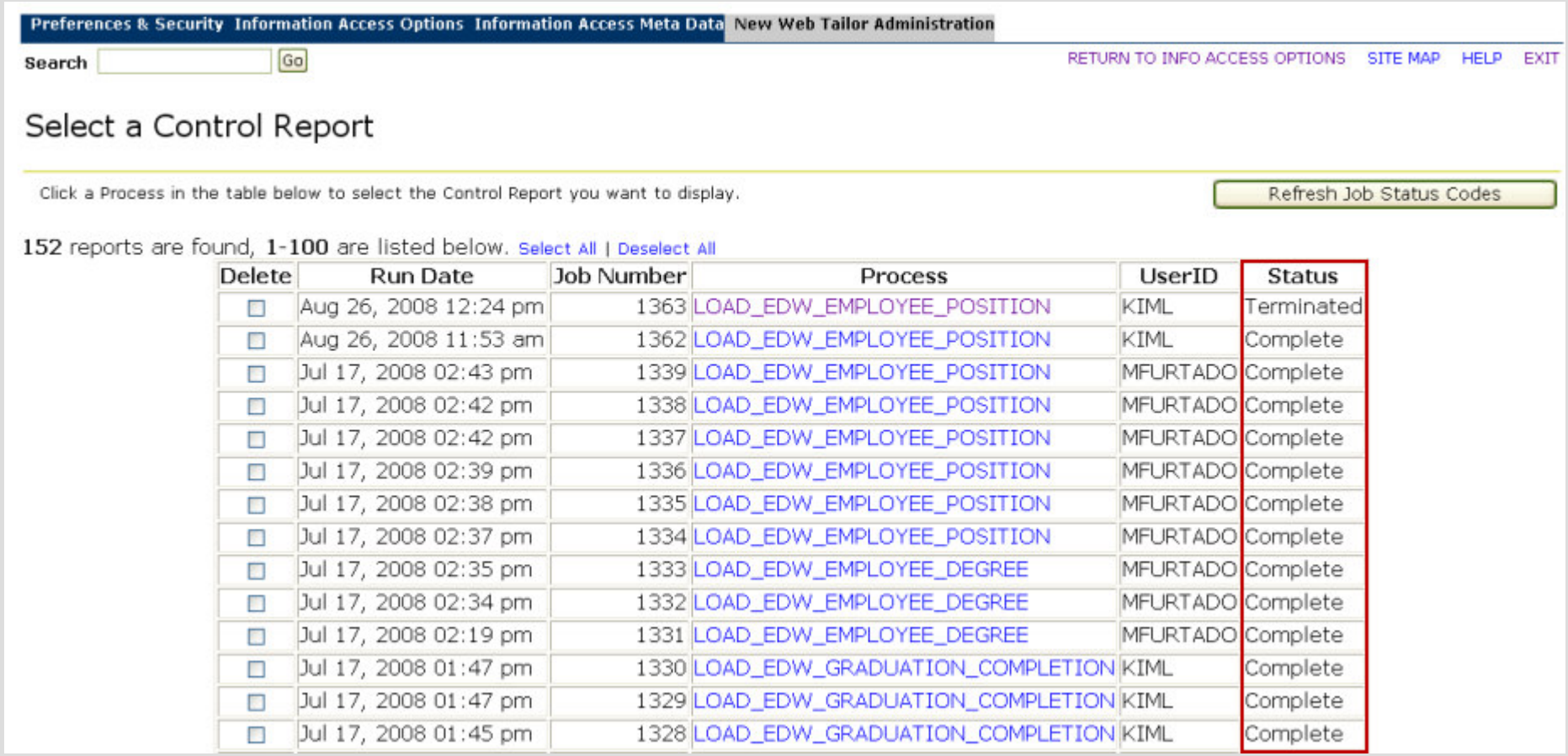
- **Load**
  - Use the Load options to run a mapping that will load the corresponding star.
- **Fix**
  - Use the Fix options to run a mapping that load the corresponding star, but use the cleansing error table as input.

The Administrative UI
Schedule a process

EDW Utilities

- **EDW Checks and Balances**
  - Provides valuable information after an upgrade or intermittently to ensure EDW components exist and are valid.
- **Load EDW Data Default Cleansing Values**
  - Load EDW Data Default Cleansing Values must be run before loading the stars.

The Administrative UI
View Control Reports

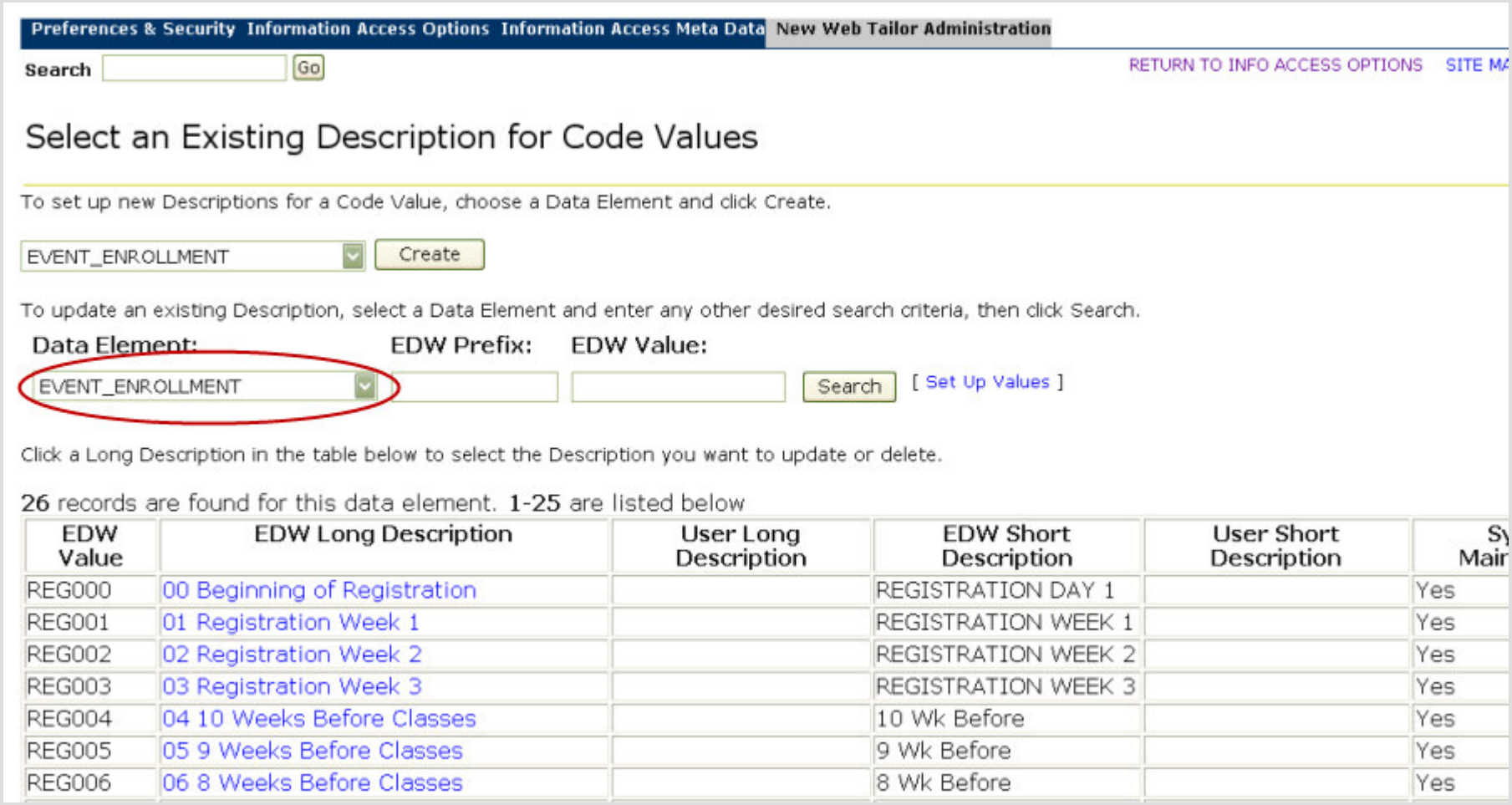


Delete	Run Date	Job Number	Process	UserID	Status
☐	Aug 26, 2008 12:24 pm	1363	LOAD_EDW_EMPLOYEE_POSITION	KIML	Terminated
☐	Aug 26, 2008 11:53 am	1362	LOAD_EDW_EMPLOYEE_POSITION	KIML	Complete
☐	Jul 17, 2008 02:43 pm	1339	LOAD_EDW_EMPLOYEE_POSITION	MFURTADO	Complete
☐	Jul 17, 2008 02:42 pm	1338	LOAD_EDW_EMPLOYEE_POSITION	MFURTADO	Complete
☐	Jul 17, 2008 02:42 pm	1337	LOAD_EDW_EMPLOYEE_POSITION	MFURTADO	Complete
☐	Jul 17, 2008 02:39 pm	1336	LOAD_EDW_EMPLOYEE_POSITION	MFURTADO	Complete
☐	Jul 17, 2008 02:38 pm	1335	LOAD_EDW_EMPLOYEE_POSITION	MFURTADO	Complete
☐	Jul 17, 2008 02:37 pm	1334	LOAD_EDW_EMPLOYEE_POSITION	MFURTADO	Complete
☐	Jul 17, 2008 02:35 pm	1333	LOAD_EDW_EMPLOYEE_DEGREE	MFURTADO	Complete
☐	Jul 17, 2008 02:34 pm	1332	LOAD_EDW_EMPLOYEE_DEGREE	MFURTADO	Complete
☐	Jul 17, 2008 02:19 pm	1331	LOAD_EDW_EMPLOYEE_DEGREE	MFURTADO	Complete
☐	Jul 17, 2008 01:47 pm	1330	LOAD_EDW_GRADUATION_COMPLETION	KIML	Complete
☐	Jul 17, 2008 01:47 pm	1329	LOAD_EDW_GRADUATION_COMPLETION	KIML	Complete
☐	Jul 17, 2008 01:45 pm	1328	LOAD_EDW_GRADUATION_COMPLETION	KIML	Complete

The Administrative UI
Maintaining Descriptions

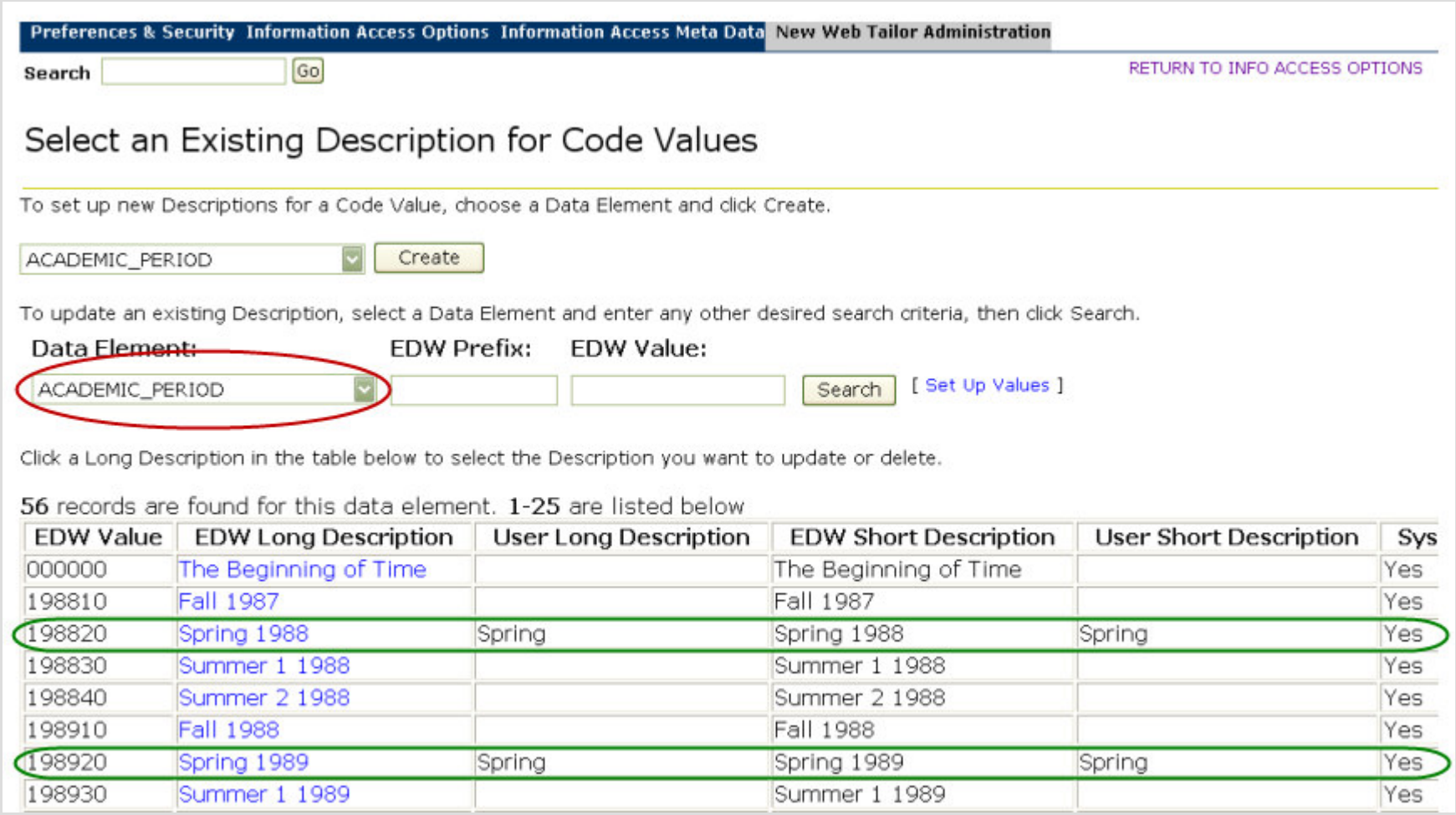
- Original long descriptions from Banner validation tables, sometimes with codes as prefixes
- Original short descriptions validation table descriptions from Banner
- Manually entered descriptions, if present, will over-ride initial ones (e.g. Academic Periods, Majors)
- Descriptions are associated with codes from business information during the load of the warehouse

The Administrative UI
Maintain Descriptions For Code Values (event → enrollment)



EDW Value	EDW Long Description	User Long Description	EDW Short Description	User Short Description	Sy Mair
REG000	00 Beginning of Registration		REGISTRATION DAY 1		Yes
REG001	01 Registration Week 1		REGISTRATION WEEK 1		Yes
REG002	02 Registration Week 2		REGISTRATION WEEK 2		Yes
REG003	03 Registration Week 3		REGISTRATION WEEK 3		Yes
REG004	04 10 Weeks Before Classes		10 Wk Before		Yes
REG005	05 9 Weeks Before Classes		9 Wk Before		Yes
REG006	06 8 Weeks Before Classes		8 Wk Before		Yes

The Administrative UI
Maintain Descriptions For Code Values (academic period)

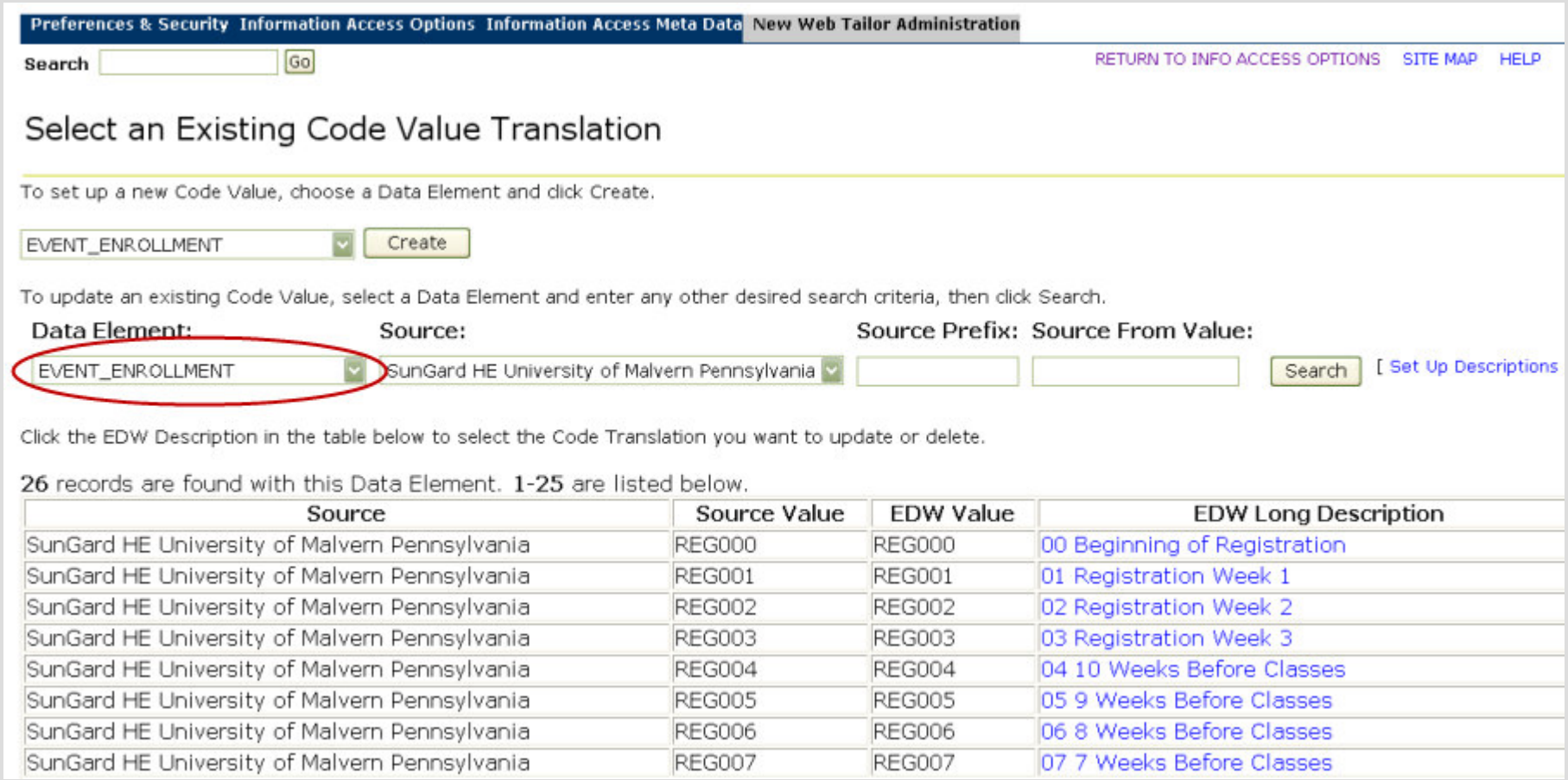


EDW Value	EDW Long Description	User Long Description	EDW Short Description	User Short Description	Sys
000000	The Beginning of Time		The Beginning of Time		Yes
198810	Fall 1987		Fall 1987		Yes
198820	Spring 1988	Spring	Spring 1988	Spring	Yes
198830	Summer 1 1988		Summer 1 1988		Yes
198840	Summer 2 1988		Summer 2 1988		Yes
198910	Fall 1988		Fall 1988		Yes
198920	Spring 1989	Spring	Spring 1989	Spring	Yes
198930	Summer 1 1989		Summer 1 1989		Yes

The Administrative UI
Translating Codes

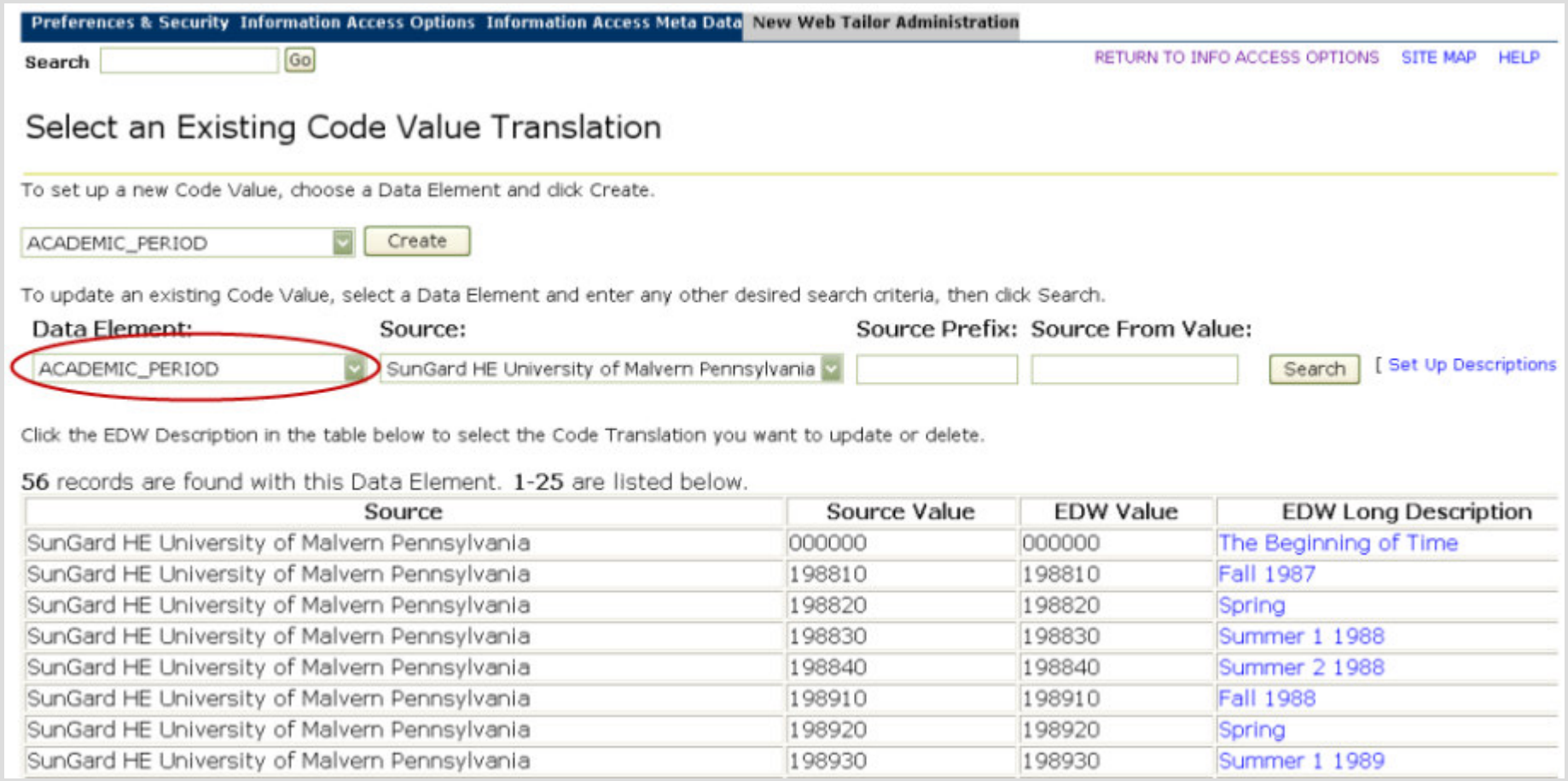
- Codes as found in Banner can be associated with different code values in the warehouse
  - **Simple translation, one-to-one**
  - **Range translation**
- More than one code in Banner can be associated with one code and its description in the warehouse

The Administrative UI
Translate Code Values from Source Data (event → enrollment)

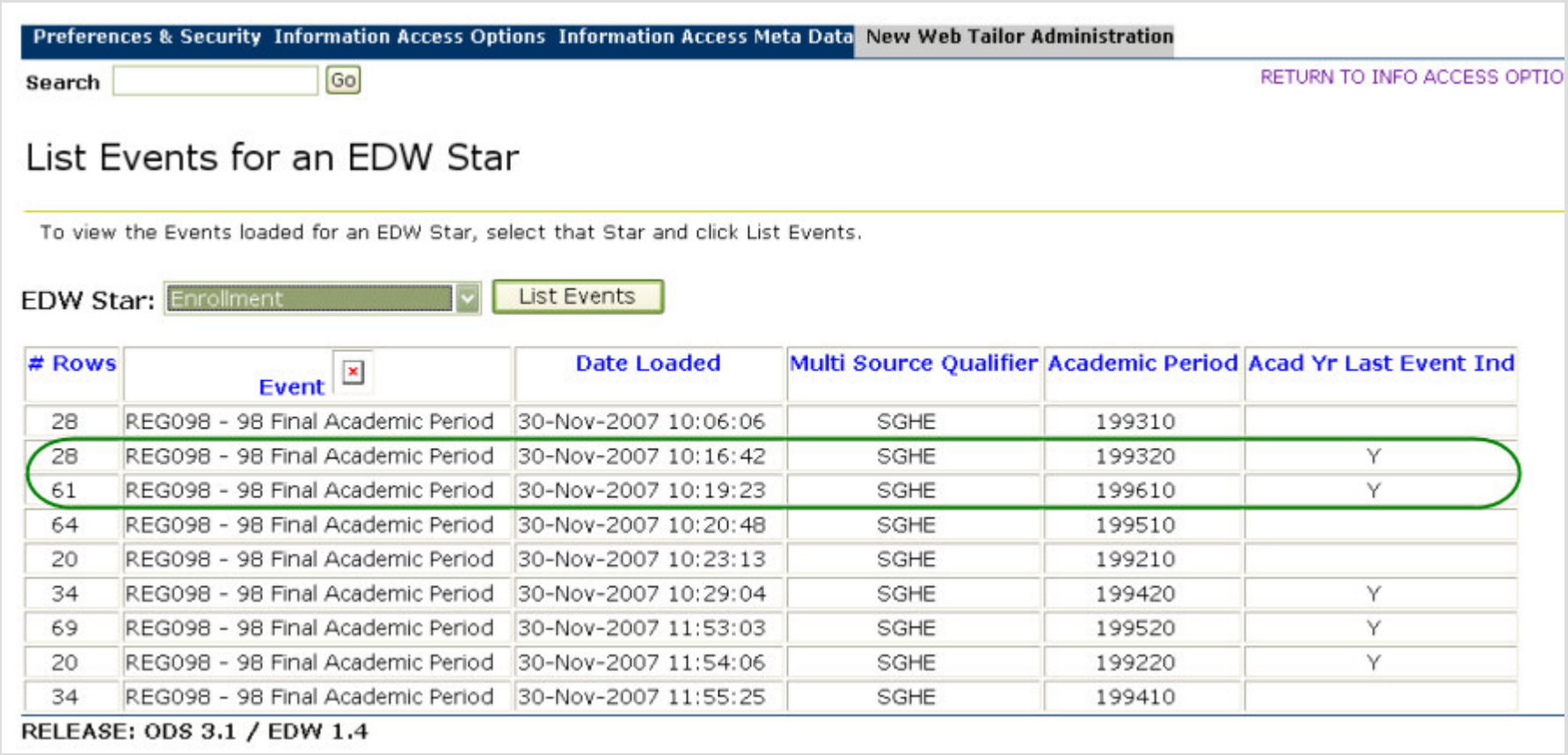


Source	Source Value	EDW Value	EDW Long Description
SunGard HE University of Malvern Pennsylvania	REG000	REG000	00 Beginning of Registration
SunGard HE University of Malvern Pennsylvania	REG001	REG001	01 Registration Week 1
SunGard HE University of Malvern Pennsylvania	REG002	REG002	02 Registration Week 2
SunGard HE University of Malvern Pennsylvania	REG003	REG003	03 Registration Week 3
SunGard HE University of Malvern Pennsylvania	REG004	REG004	04 10 Weeks Before Classes
SunGard HE University of Malvern Pennsylvania	REG005	REG005	05 9 Weeks Before Classes
SunGard HE University of Malvern Pennsylvania	REG006	REG006	06 8 Weeks Before Classes
SunGard HE University of Malvern Pennsylvania	REG007	REG007	07 7 Weeks Before Classes

The Administrative UI
Translate Code Values from Source Data (academic period)



The Administrative UI
List Events for an EDW Star



Preferences & Security | Information Access Options | Information Access Meta Data | New Web Tailor Administration

Search Go

RETURN TO INFO ACCESS OPTIO

List Events for an EDW Star

To view the Events loaded for an EDW Star, select that Star and click List Events.

EDW Star: Enrollment List Events

# Rows	Event	Date Loaded	Multi Source Qualifier	Academic Period	Acad Yr Last Event Ind
28	REG098 - 98 Final Academic Period	30-Nov-2007 10:06:06	SGHE	199310	
28	REG098 - 98 Final Academic Period	30-Nov-2007 10:16:42	SGHE	199320	Y
61	REG098 - 98 Final Academic Period	30-Nov-2007 10:19:23	SGHE	199610	Y
64	REG098 - 98 Final Academic Period	30-Nov-2007 10:20:48	SGHE	199510	
20	REG098 - 98 Final Academic Period	30-Nov-2007 10:23:13	SGHE	199210	
34	REG098 - 98 Final Academic Period	30-Nov-2007 10:29:04	SGHE	199420	Y
69	REG098 - 98 Final Academic Period	30-Nov-2007 11:53:03	SGHE	199520	Y
20	REG098 - 98 Final Academic Period	30-Nov-2007 11:54:06	SGHE	199220	Y
34	REG098 - 98 Final Academic Period	30-Nov-2007 11:55:25	SGHE	199410	

RELEASE: ODS 3.1 / EDW 1.4

The Administrative UI
EDW Security

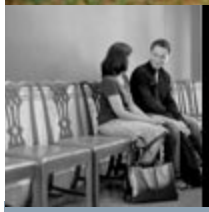
Users

- Oracle users who require an Oracle user account in your source system so they can access the ODS to build reports
- Administrative users who require a user account in the Administrative UI so they can use the UI to maintain the ODS/EDW

Layers

- Reporting tool
- Database objects
- Data values

Value based security is implemented using Oracle's Fine Grained Access (FGAC).



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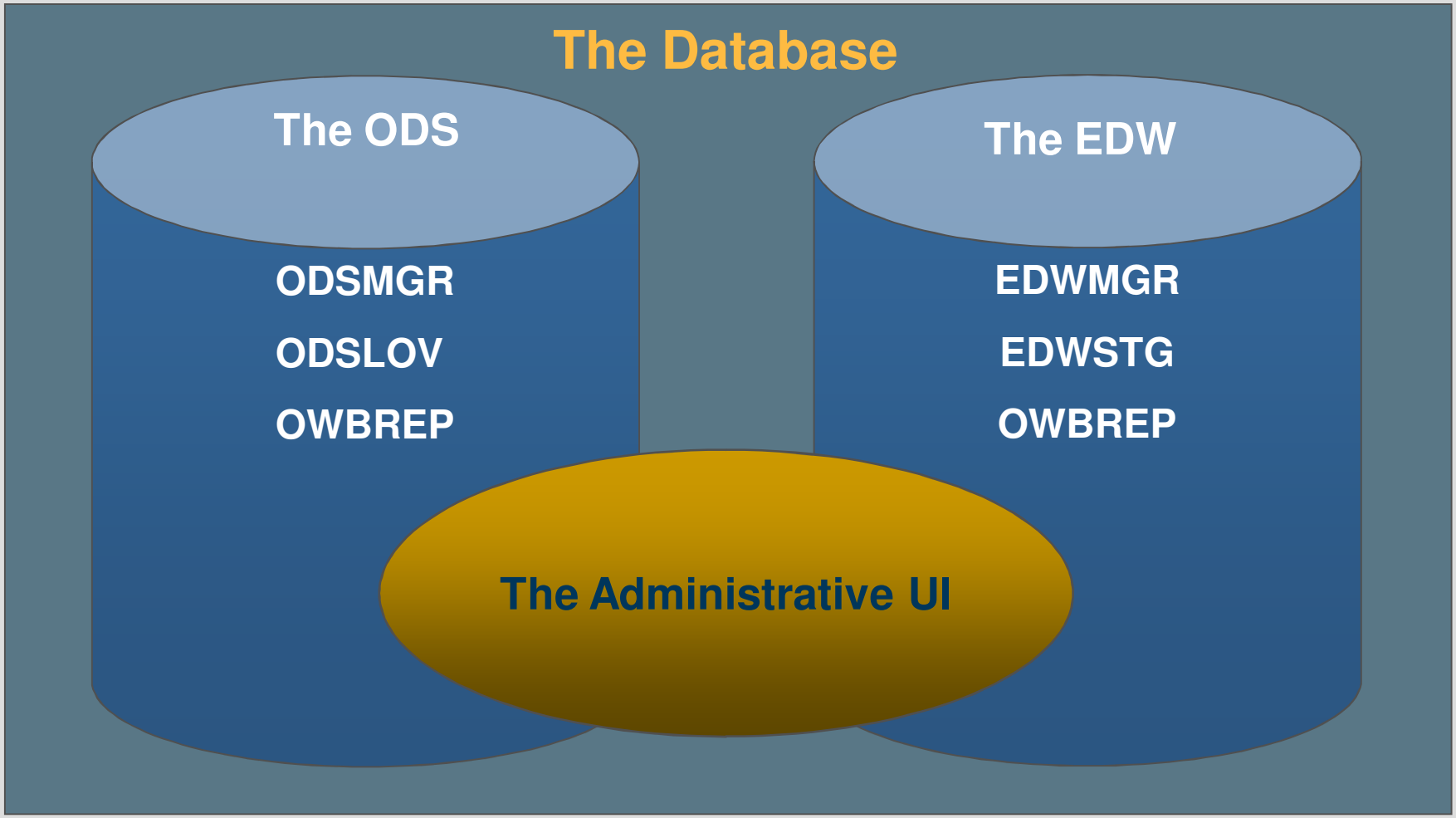
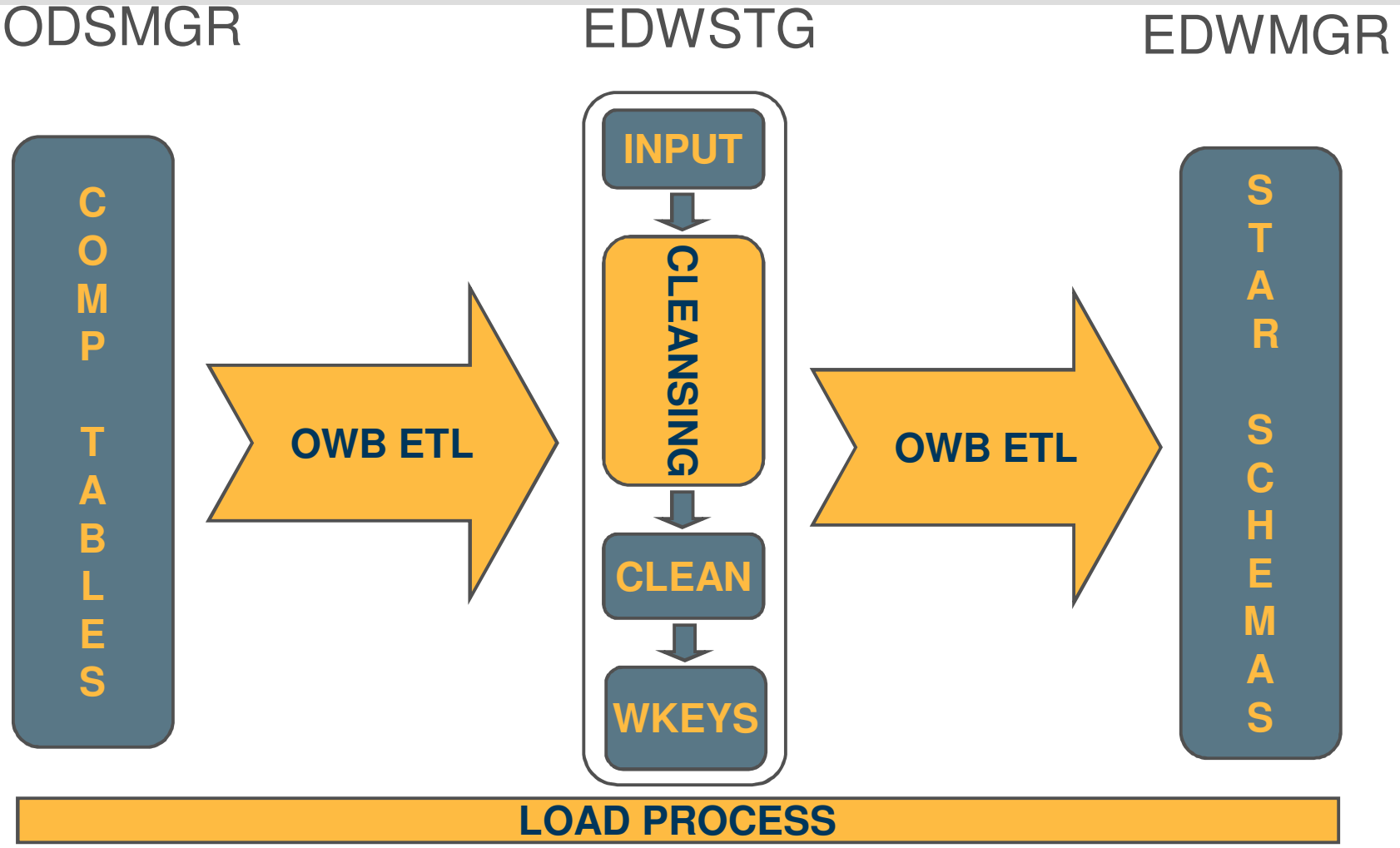
EDW Architecture

EDW Architecture
Oracle



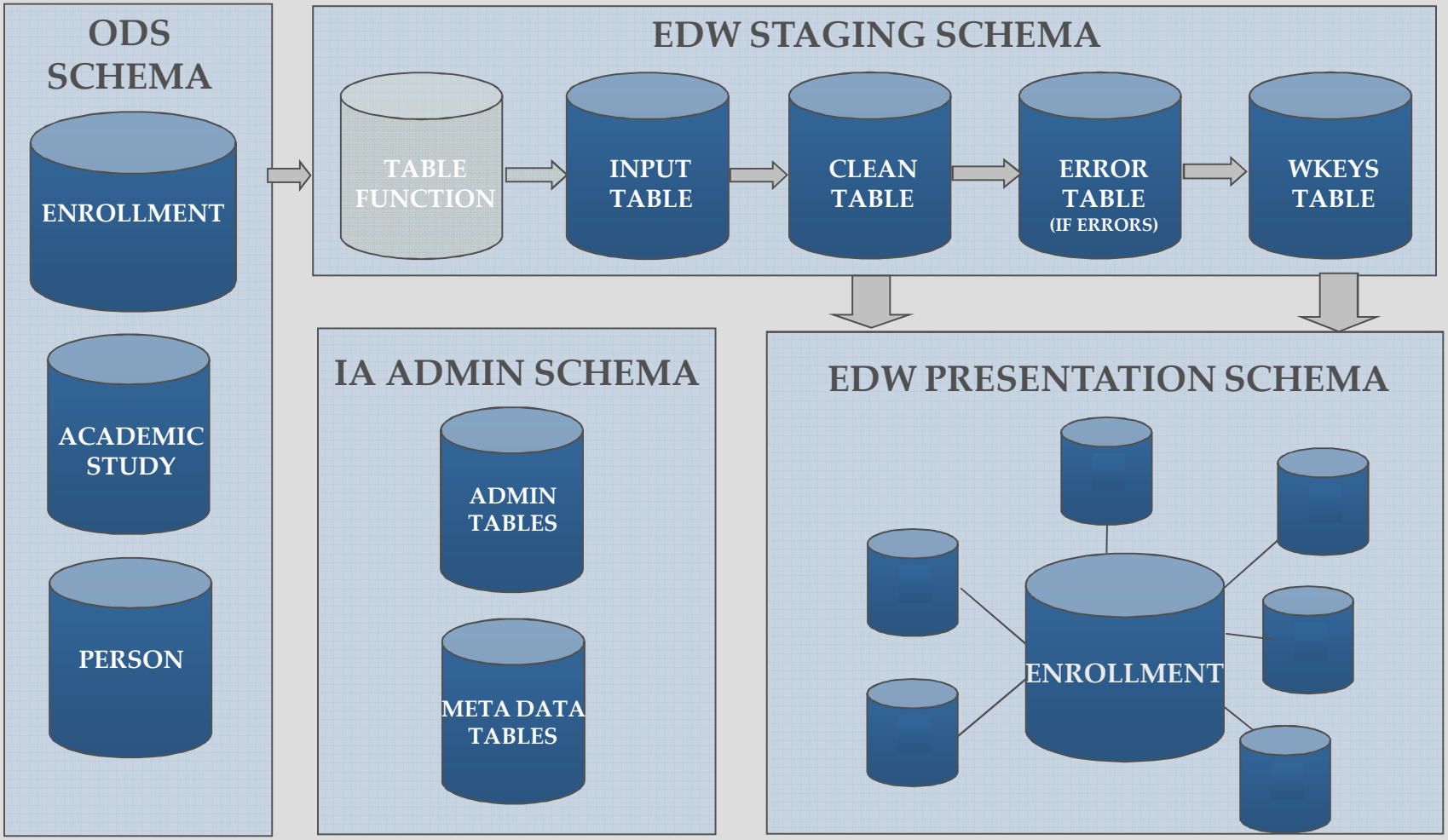
EDW Architecture
The Architecture



EDW Architecture
The Load Process

- **Start with the ODS**
  - Extract from the ODS (*_EXTR)
  - Into the EDWSTG Target (*_INPUT)
- **Cleansing**
  - Input from the ODS (*_INPUT)
  - The ‘Clean’ ODS (*_CLEAN) (Not the *_ERROR)
  - Finding the Keys (*_WKEYS)
- **Updating the Star**
- **Creating the Cube**

EDW Architecture
The Load Process



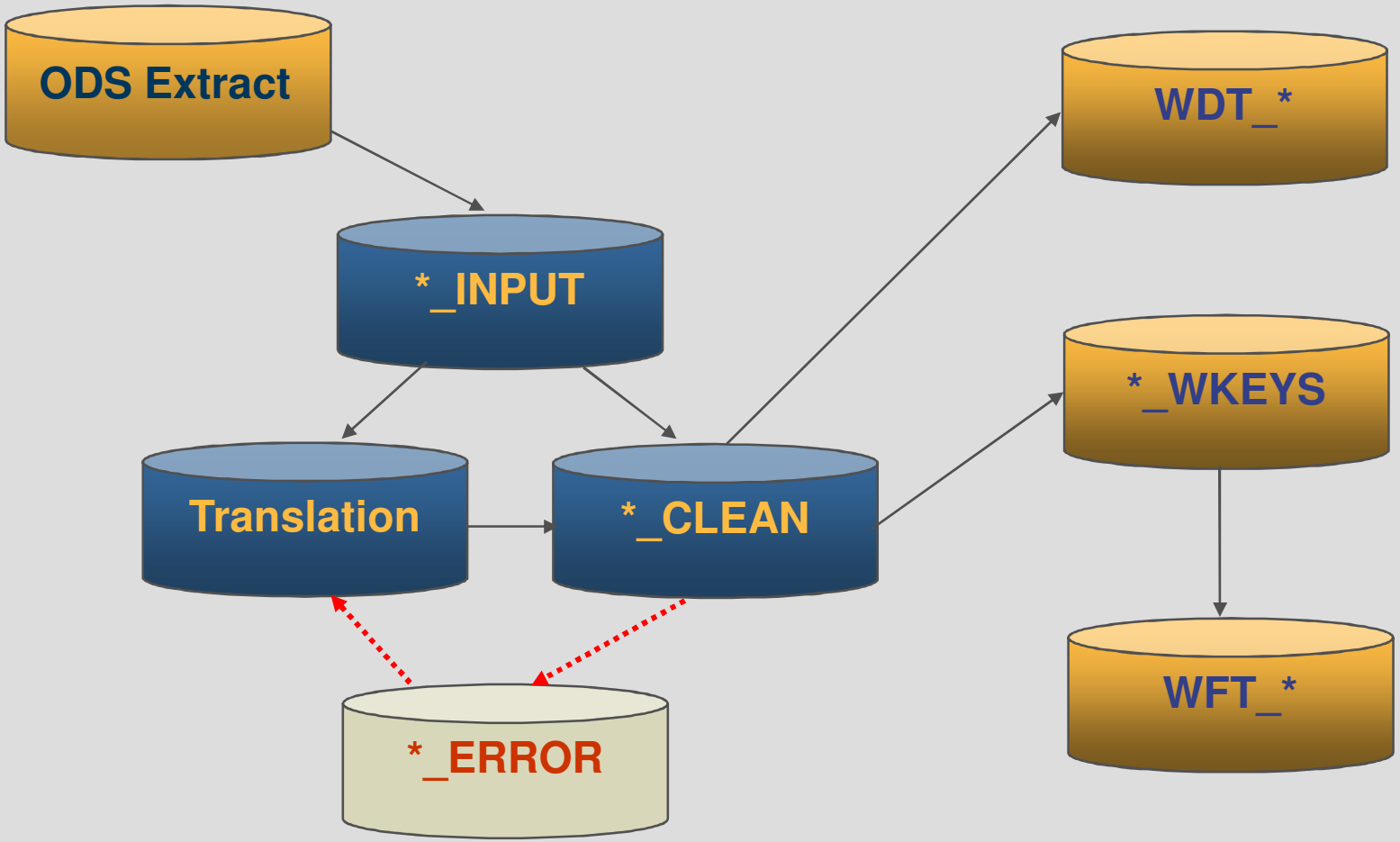
EDW Architecture
The Cleansing Process

- "Cleansing" is the process of verifying ODS code values and possibly translating them to standardized code values in the EDW. It's used to:
  - **Remove duplicate code values before loading them into the EDW.**
  - **Translate a code value in the ODS to a new value in the EDW.**
  - **Change an ODS description value to a new value in the EDW.**
  - **Group together a range of ODS code values into one EDW value.**

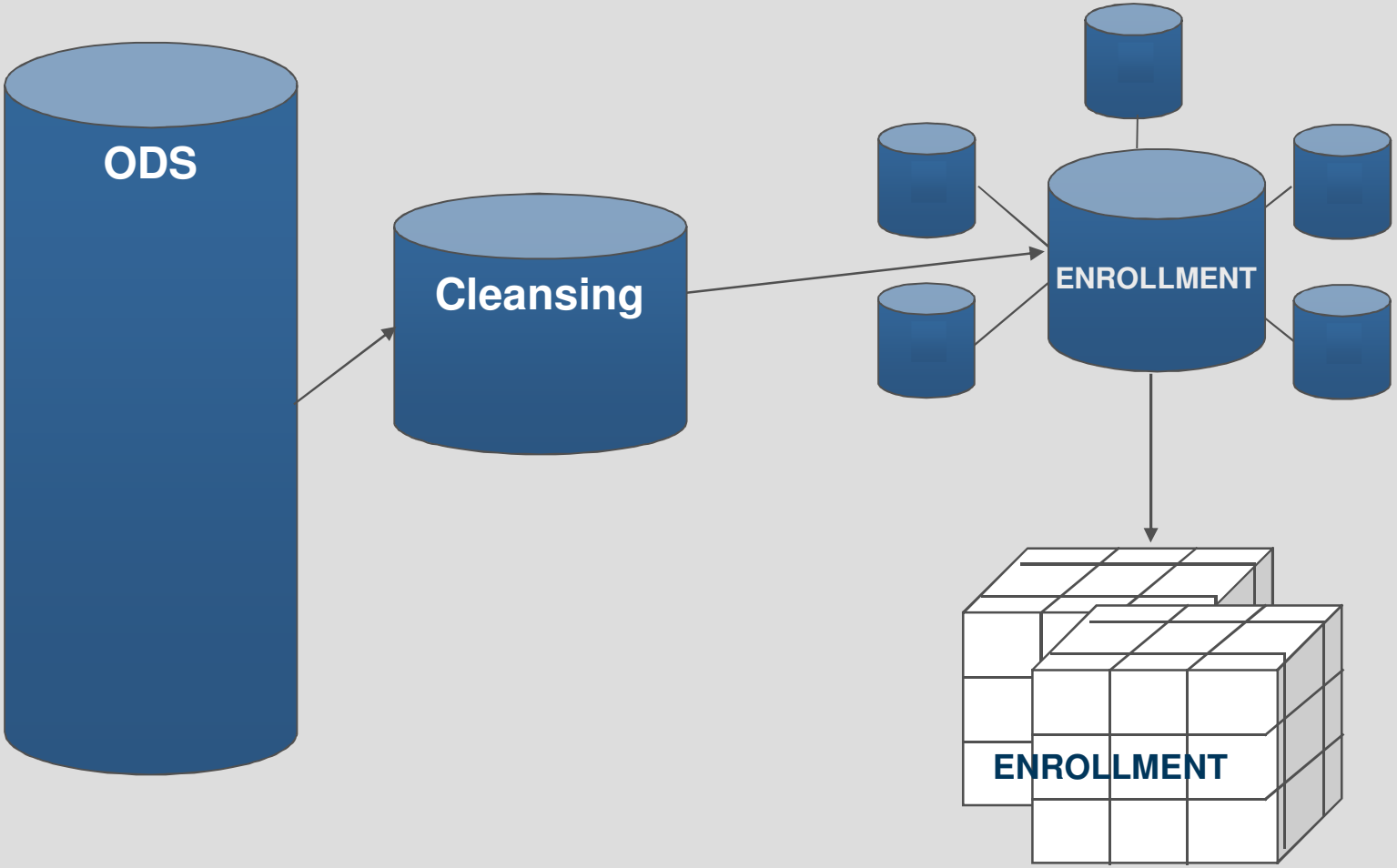
EDW Architecture
The Cleansing Process

1. Extract data from the ODS into INPUT staging table.
2. Cleanse the data from the INPUT table and load it into the associated CLEAN table.
3. Update the DIMENSION tables with the unique combinations of dimensional attributes extracted from the CLEAN tables.
4. Insert the surrogate keys returned from the join of the CLEAN table with its associated DIMENSION tables into the associated WKEYS table.
5. Load data from the WKEYS table into the FACT table.

EDW Architecture
The Cleansing Process



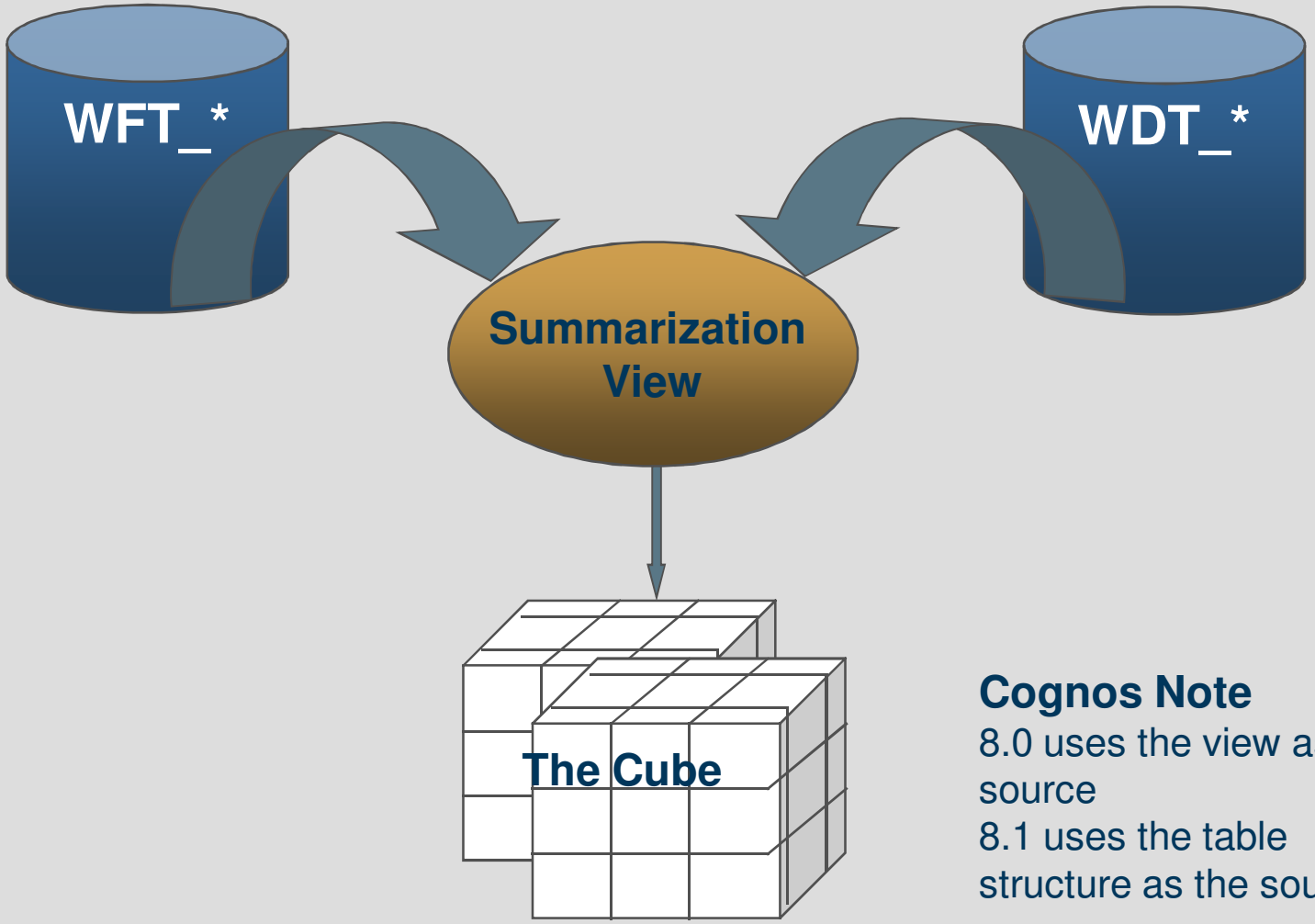
EDW Architecture
ODS → Cube



EDW Architecture
ODS → Cube

- The Source: The ODS (Believe in it or beware!)
- Cleansing: Translation and Extension
- The Star Schema: Storing and Identifying One Slice Among Others
- The Cube: Fast and Flexible within a Rigid (but modifiable) Structure

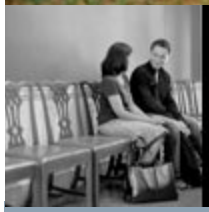
EDW Architecture
Tables → Cube



Cognos Note
8.0 uses the view as the source
8.1 uses the table structure as the source

EDW Architecture
Tables → Cube

- The Tables: The EDW Fact and Dimension Tables
- View: Summarize Fact and Dimension data
- The Cube: Fast and Flexible within a Rigid (but modifiable) Structure



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Testing and Documentation

Testing and Documentation

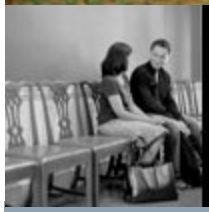
- The ODS Foundation
- Testing at the Reporting Tool level (Cube)
- Testing at the Star Schema level
- Testing at all levels: Banner, ODS
- Identifying the information that's missing
- Identifying measures and dimensions that are not included
- Make sure the query answers the business question identified
- Identifying the default query for each cube
- Identify documentation needs

Testing and Documentation

- **Test against reports you trust**
  - Against the ODS
  - Against Banner
  - Banner forms
- **Testing at the Star Schema level**
  - Create reports as focused on potential issues
- **Testing Sufficiency of Content**
  - Are measures supportive of the Strategic Plan?
  - Are measures supportive of critical objectives?

Testing and Documentation

- **The ODS/EDW Handbook**
  - Provide core application documentation of both supporting processing and usage considerations
  - EDW ERD
  - Delivered in Adobe Acrobat format
- **The Meta Data**
  - Provides documentation of both target and source
    - At Target Star Schema and ODS Source View level
    - At the Column level
    - Relates EDW to ODS, and ODS to Banner
  - Customizable at the local level
  - Delivered as data within the database to be subsequently generated as static HTML for deployment on the client intranet
  - Top-level page: ODS_index.html



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EDW Technical Components

Technical Components
MGRCVAL and MGRCDES

- When the EDW is installed, the Load EDW Data Cleansing Values process is run.
  - This loads values into the MGRCVAL and MGRCDES tables with information from the ODS tables.
  - These records are flagged with a “System Maintained” indicator in order to differentiate them from changes you might make, so that your changes are retained when the Cleansing Load process is rerun.
- You can use the Administrative UI to add and edit records in the MGRCVAL and MGRCDES tables.

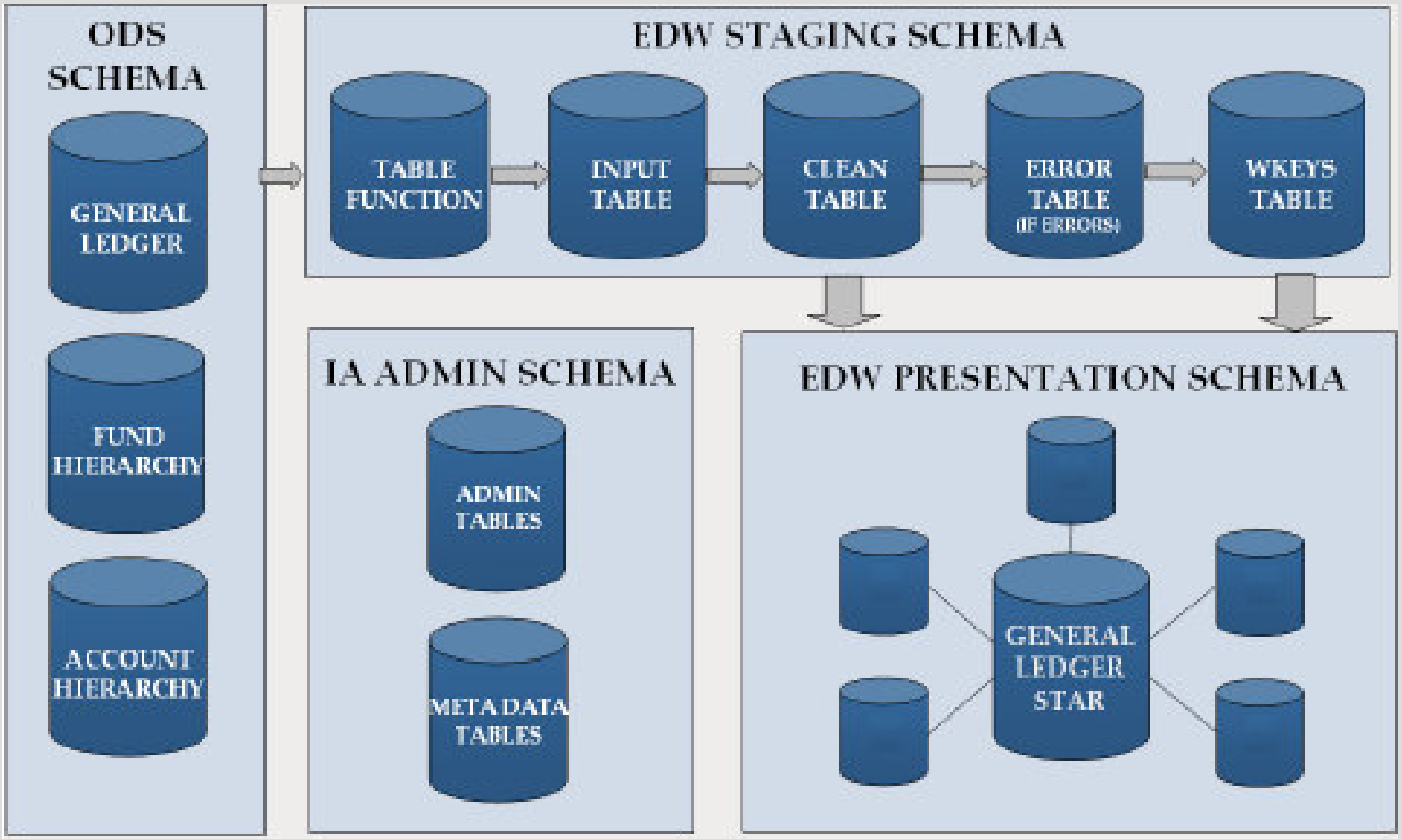
Technical Components
MGRCVAL and MGRCDES

- MGRCVAL stores code values from the ODS with the code values they translate to in the EDW.
- MGRCDES stores the descriptions for every EDW code value defined in the MGRCVAL table.
- Schema Owner: IA_ADMIN

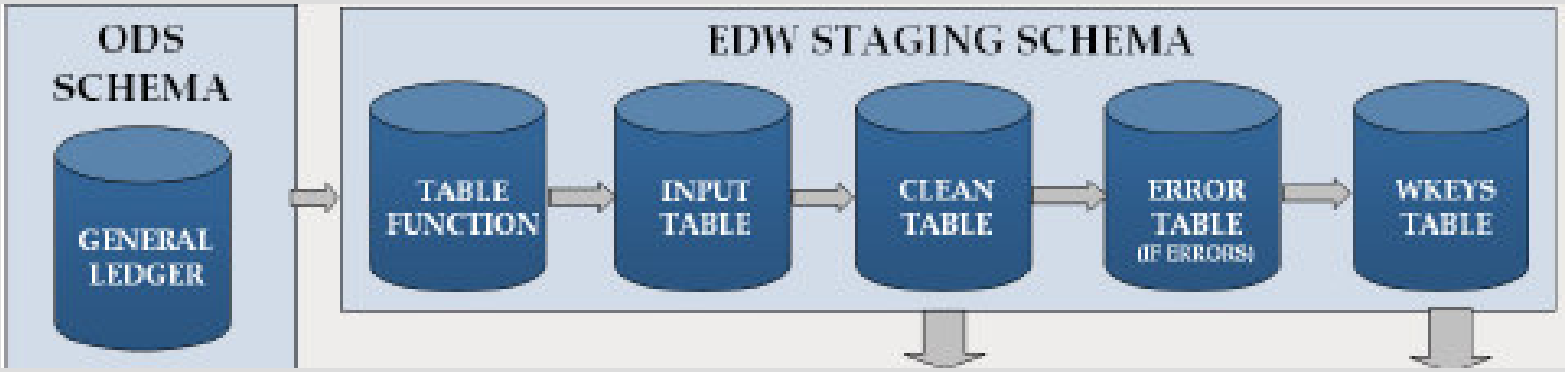
Technical Components
MTVPARM

- MTVPARM contains the internal parameters used by the EDW during processing.
  - They are defined within the MTVPARM table with an MTVPARM_INTERNAL_CODE_GROUP of 'EDW EXTRACT PARAMETERS'.:
    - HR_APPL_STAT
    - EARNINGS
    - Student Groups—STUDENT_LEVEL_GROUP, TEST, STUDENT_LEVEL_GROUP_TESTS
- Schema Owner: IA_ADMIN

EDW Technical Components
Snapshot Star Load Process



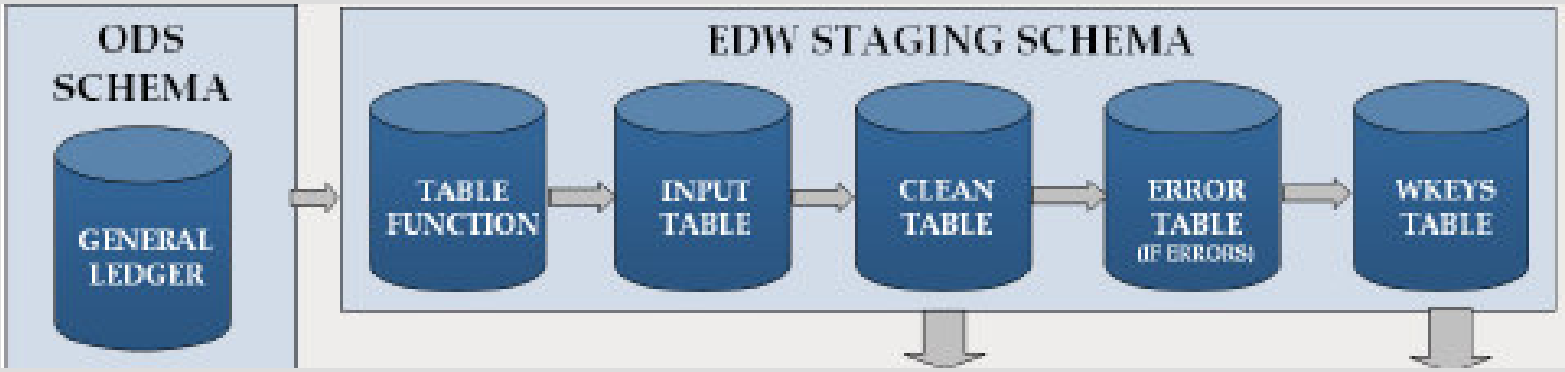
EDW Technical Components



INPUT OWB ETL

- Data is extracted from the ODS using pipelined table functions.
- Data is extracted based upon user defined parameters for a point-in time slice of data.
- EDW_%_EXTR
- The extracted data is loaded into INPUT TABLES in a staging area

EDW Technical Components



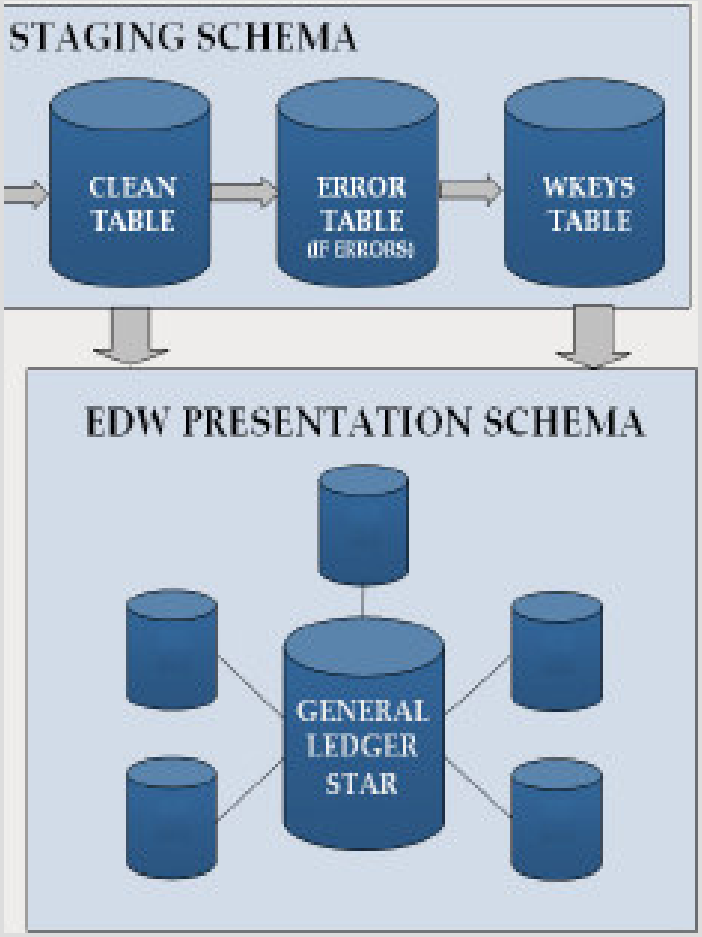
CLEAN OWB ETL

- Extracted data is cleansed based upon the institutional preferences.
- Cleansed data is loaded into CLEAN TABLE in the staging area
- EDW_%_CLEAN
- MGKDCLS.P_Cleanse_Input

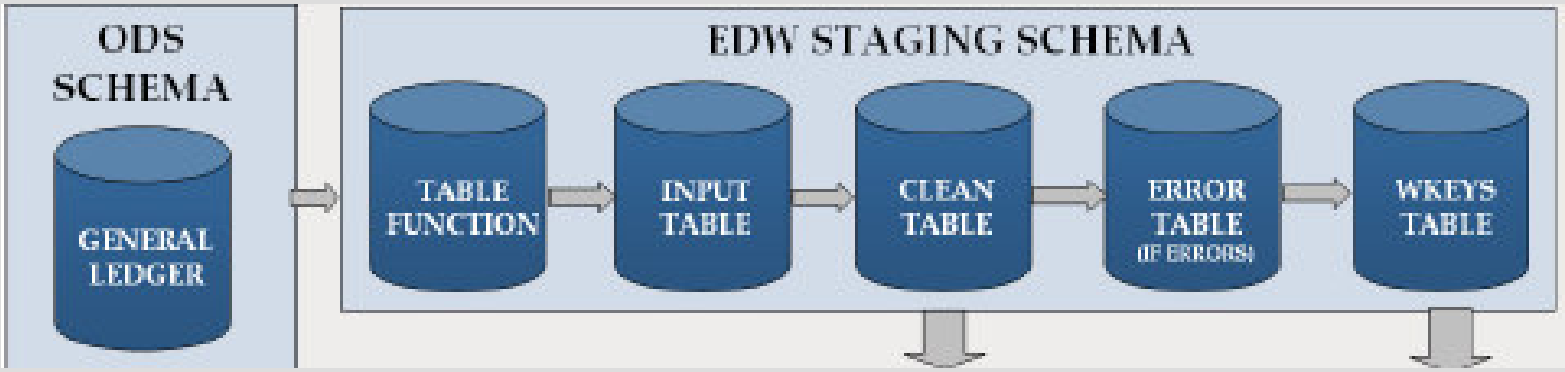
EDW Technical Components

DIM OWB ETL

- The unique dimensional attribute combinations are then inserted into the dimension tables with a uniquely defined surrogate key
- **EDW_%_DIM_TIME_INSERT/UPDATE**
- **EDW_%_DIM_*TABLE_NAME***



EDW Technical Components



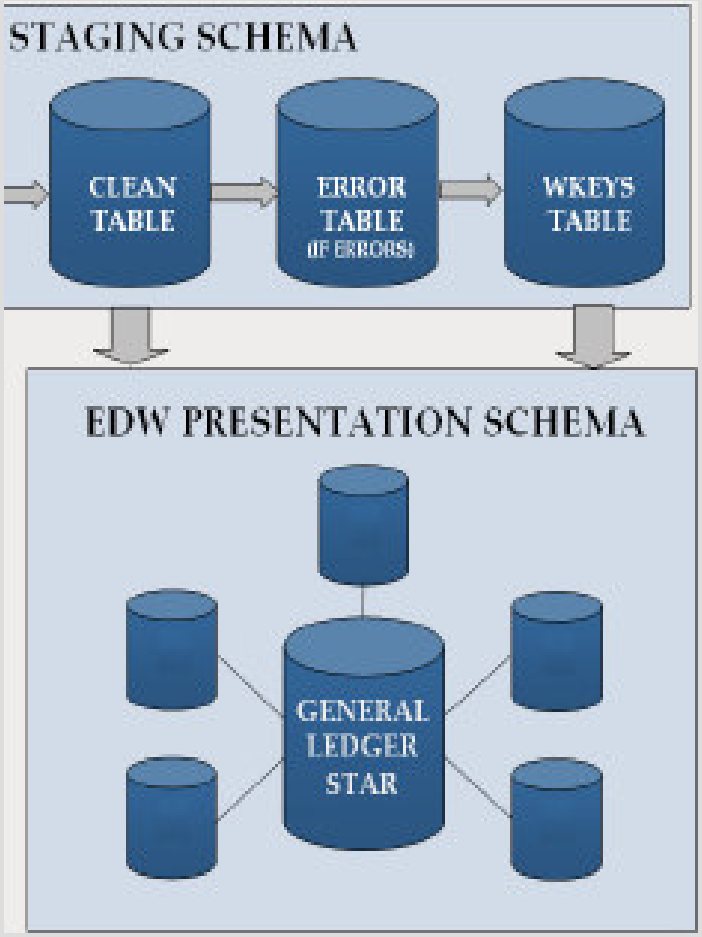
WKEYS OWB ETL

- New dimension data elements combinations extracted from the CLEAN table are inserted into the corresponding WKEYS table.
- EDW_%_WKEYS

EDW Technical Components

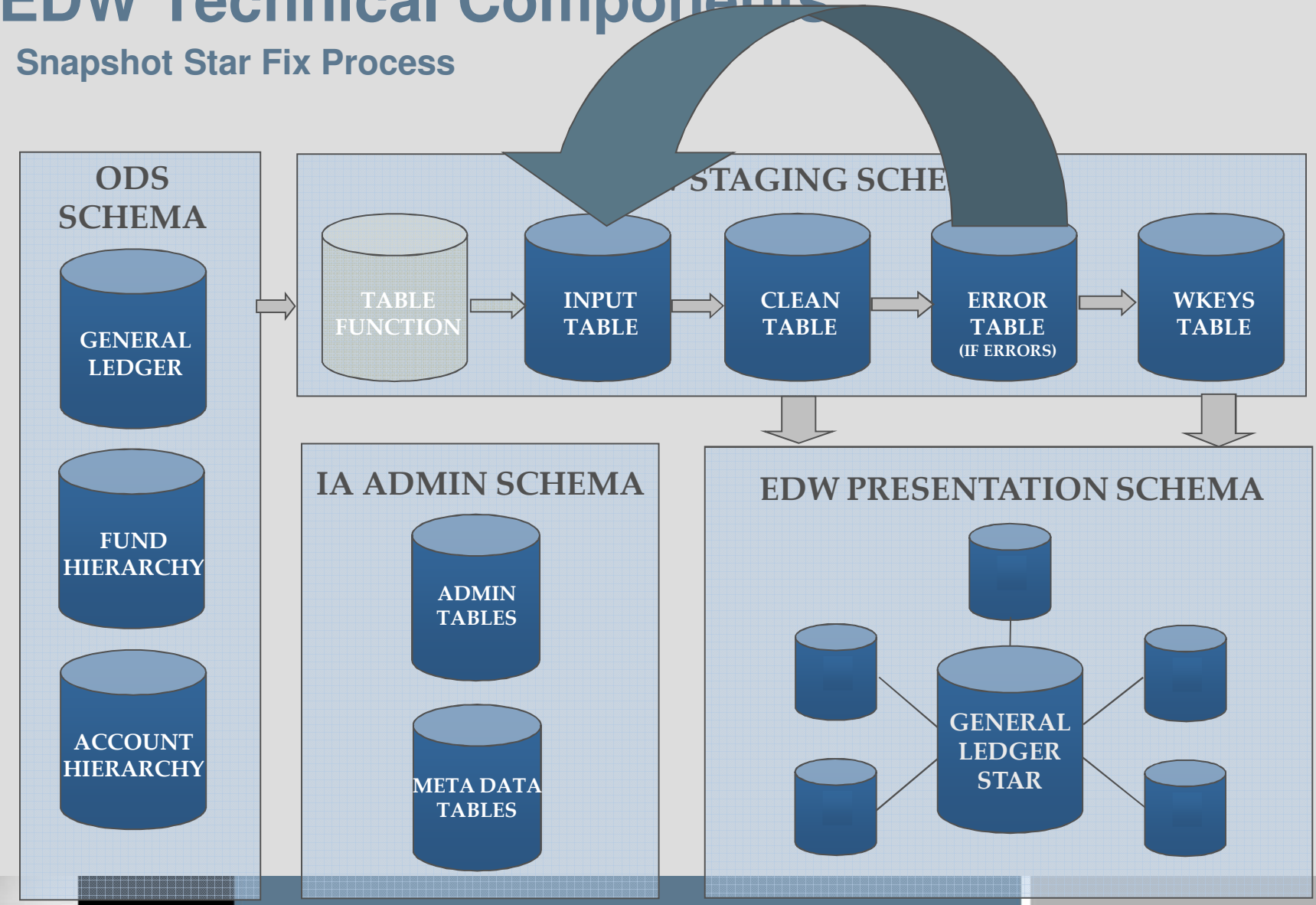
FACT OWB ETL

- The facts of the extracted data are then loaded into the fact table(s) along with the surrogate keys defining each record's unique combination of dimensional attributes.
- **EDW_%_FACT_INSERT/DELETE**



EDW Technical Components

Snapshot Star Fix Process



Questions?

Thanks!
Susan.Shaw@sungardhe.com