



Enterprise Data Warehouse (EDW) Training For Foothill - De Anza Community College District

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Banner Performance Reporting and Analytics
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Introductions



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



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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)





EDW Overview

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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



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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

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 PowerPlay cubes

- **Captures Historical Information**

- Event Snapshots Based on Institutional Business Need
- Enables Trend Analysis, Forecasting



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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

- Views exist on top of each star schema as a means to load the cubes more effectively.

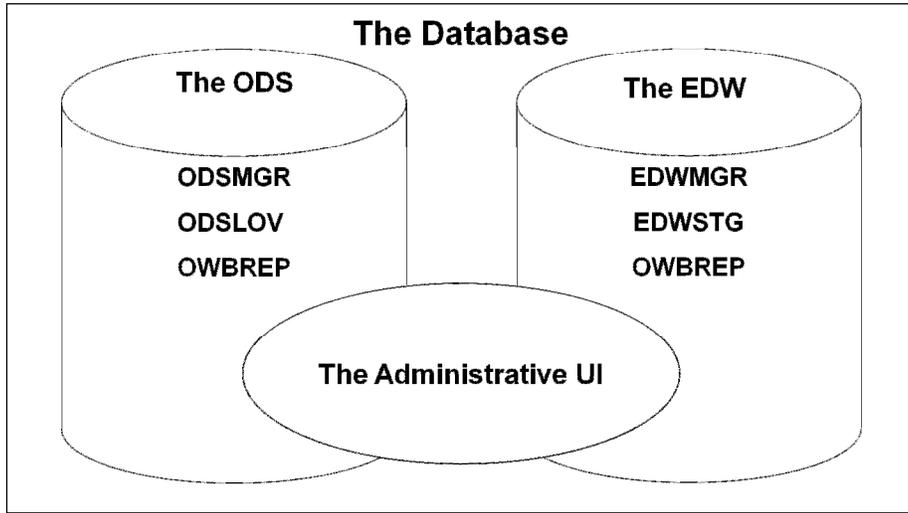
Cubes

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



EDW Overview

Oracle



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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**



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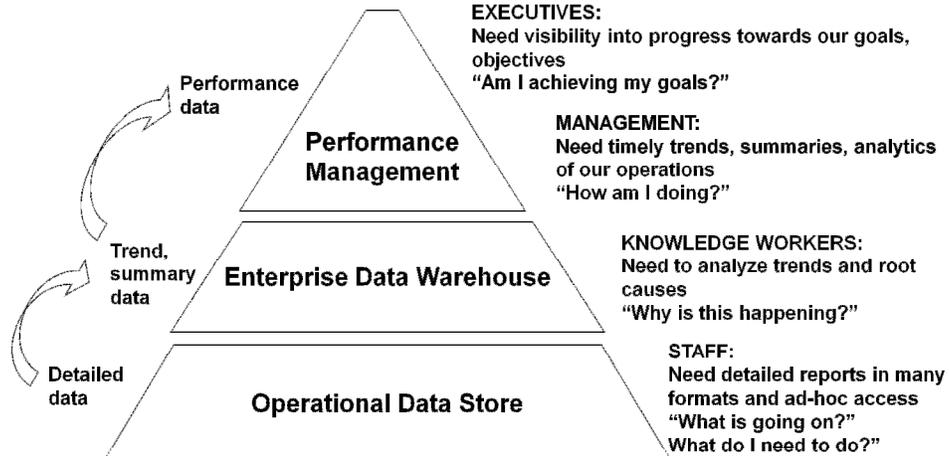
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EDW Overview

Information Model

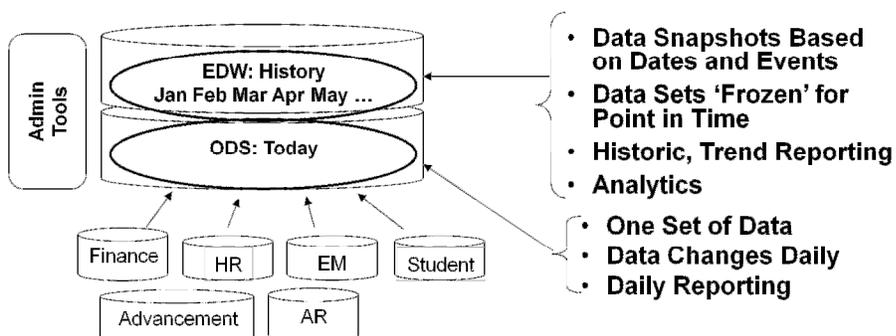
- Information needs to reach all levels of campus
- Data from lower levels must be transformed to upper levels
- Refined focus on supporting the actual business processes



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**



Designed as a Data Source to Ease Ad-Hoc Reporting

Organized into Simplified Business Concepts

Improves Information Access Performance

Source to Enterprise Data Warehouse

Ensures Consistent Reporting Results

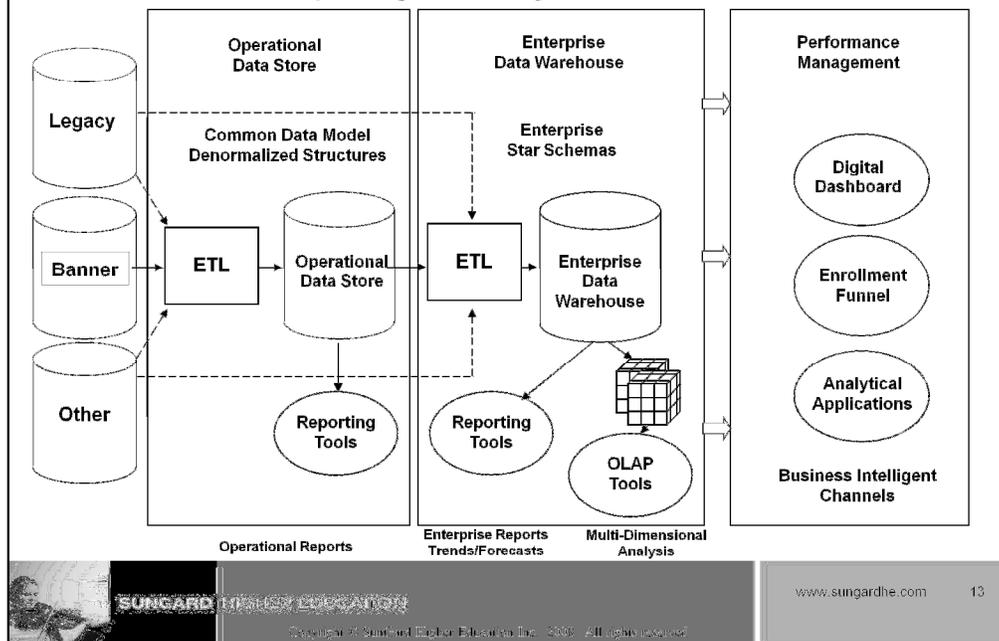
Common Data Source

Common Business Concepts

Cognos FM model and packages

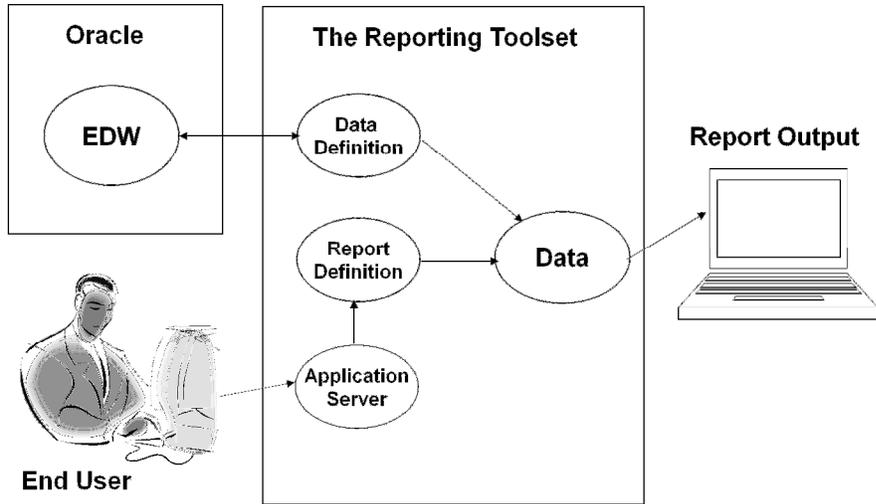
EDW Overview

Performance Reporting and Analytics Architecture



EDW Overview

EDW and the Reporting Tool



EDW Overview

ODS Report

EDW Overview

EDW Report

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.





Data Warehouse Concepts

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Data Warehouse Concepts

- **Source**
 - The ODS (whose source is Banner)
 - Other external data
- **Target**
 - Cleansing control tables
 - Business information process tables
 - Detailed 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

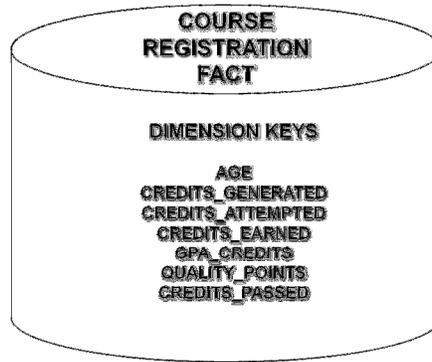


Data Warehouse Concepts

- **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



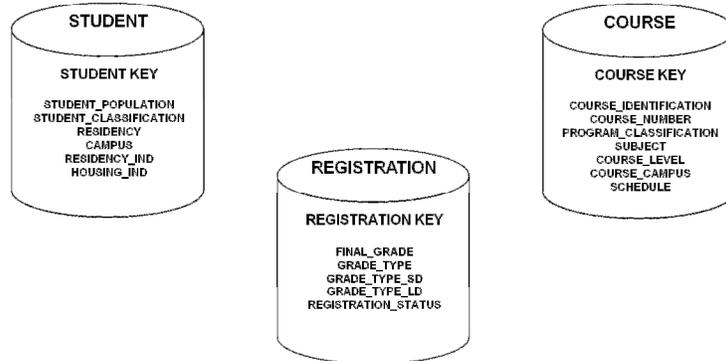
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Data Warehouse Concepts

Sample Dimension Table(s)



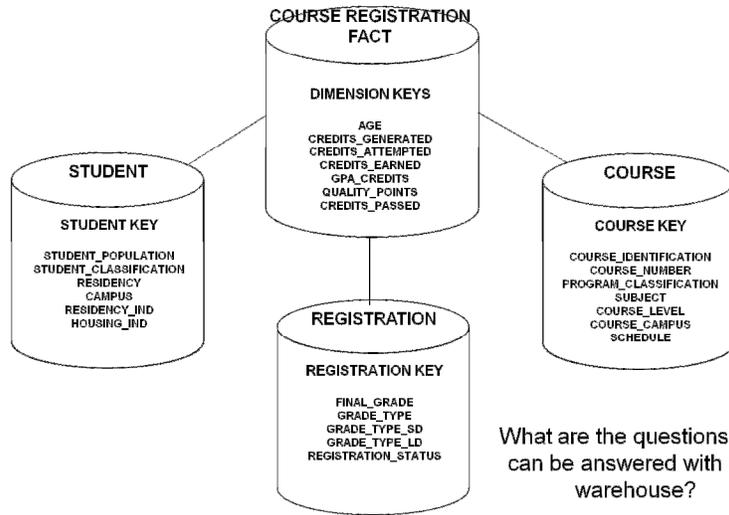
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Data Warehouse Concepts

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



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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

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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



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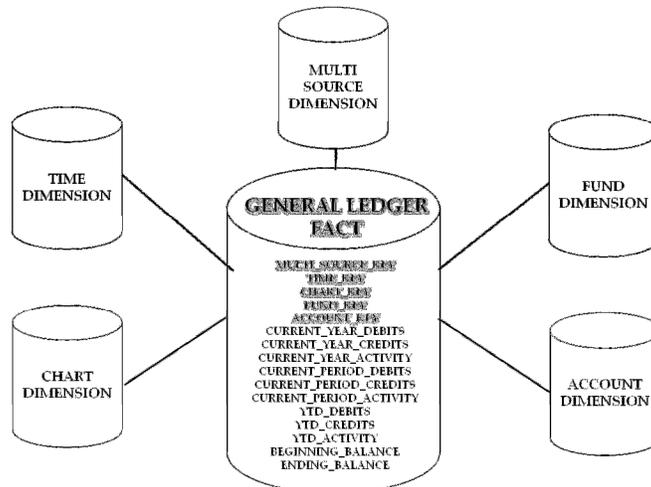
The Star Schema

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



The Star Schema

General Ledger



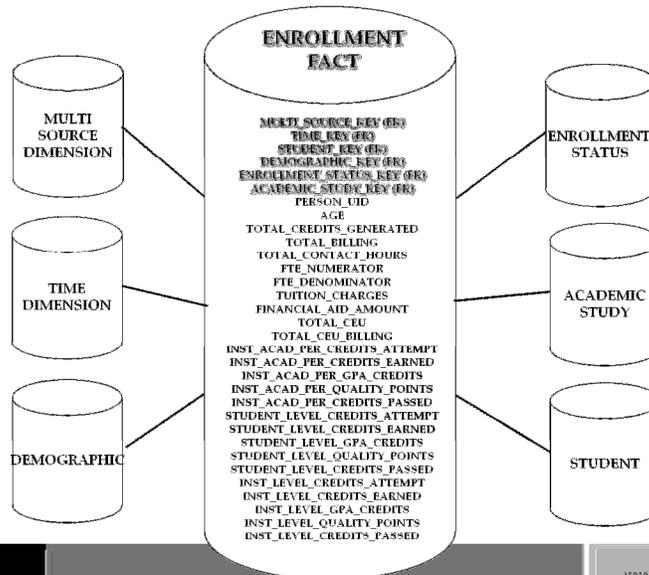
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The Star Schema

Enrollment



The Star Schema Handbook

- A review of the EDW Handbook – Chapter 7



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The Event Schedule

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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

	A	B	C	D	E	F	G	H	I	J
1	Event Description									
2	Event Code	Event Date	Event Desc							
3	REG000	00	Beginning of Registration	REGISTRATION DAY 1						
4	REG001	01	Registration Week 1	REGISTRATION WEEK 1						
5	REG002	02	Registration Week 2	REGISTRATION WEEK 2						
6	REG003	03	Registration Week 3	REGISTRATION WEEK 3						
7	REG004	04	10 Weeks Before Classes	10 Wk Before						
8	REG005	05	9 Weeks Before Classes	9 Wk Before						
9	REG006	06	8 Weeks Before Classes	8 Wk Before						
10	REG007	07	7 Weeks Before Classes	7 Wk Before						
11	REG008	08	6 Weeks Before Classes	6 Wk Before						
12	REG009	09	5 Weeks Before Classes	5 Wk Before						
13	REG010	10	4 Weeks Before Classes	4 Wk Before						
14	REG011	11	3 Weeks Before Classes	3 Wk Before						
15	REG012	12	2 Weeks Before Classes	2 Wk Before						
16	REG013	13	1 Week Before Classes	1 Wk Before						
17	REG014	14	Beginning of Classes	FIRST DAY CLASS						
18	REG015	15	First Week of Classes	Class Wk 1						
19	REG016	16	Second Week of Classes	Class Wk 2						
20	REG017	17	Third Week of Classes	Class Wk 3						
21	REG018	18	Fourth Week of Classes	Class Wk 4						
22	REG019	19	Fifth Week of Classes	Class Wk 5						
23	REG020	20	Census 1 Enrollment and Registration	CENSUS 1						
24	REG021	21	Census 2 Enrollment and Registration	CENSUS 2						
25	REG090	90	Midterm of Classes	MIDTERM						
26	REG091	91	Last Day of Classes	LAST DAY CLASS						



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

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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

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



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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

[Home](#)
[Help](#)
[About](#)
[Feedback](#)
[Contact Us](#)
[Privacy Policy](#)
[Terms of Service](#)
[Site Map](#)
[Help](#)
[Exit](#)

Select a Control Report

Click a Process in the table below to select the Control Report you want to display.

[Refresh](#) [Print](#) [Status](#) [Columns](#)

152 reports are found, 1-100 are listed below. [Select All](#) | [Deselect All](#)

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



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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)

[Programs & Security](#) | [Registration Access Options](#) | [Information Access Field Lists](#) | [Basic 1920 USER REGISTRATION](#)

Search [RETURN TO INFO ACCESS OPTIONS](#) [SITE MA](#)

Select an Existing Description for Code Values

To set up new Descriptions for a Code Value, choose a Data Element and click Create.

To update an existing Description, select a Data Element and enter any other desired search criteria, then click Search.

Data Element: **EDW Prefix:** **EDW Value:** [Set up values]

Click a Long Description in the table below to select the Description you want to update or delete.

26 records are found for this data element. 1-25 are listed below

EDW Value	EDW Long Description	User Long Description	EDW Short Description	User Short Description	Sh Maint
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)

[Prescriptions by Specialty](#)
[Information Access Options](#)
[Medical Information Access](#)

Search

[RETURN TO INFO ACCESS OPTIONS](#)

Select an Existing Description for Code Values

To set up new Descriptions for a Code Value, choose a Data Element and click Create.

ACADEMIC_PERIOD

To update an existing Description, select a Data Element and enter any other desired search criteria, then click Search.

Data Element:
 EDW Prefix:
 EDW Value:

Click a Long Description in the table below to select the Description you want to update or delete.

155 records are found for this data element. 1-25 are listed below

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



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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)

[References to Security](#)
[Information Access Options](#)
[Information About Data](#)
[NEW FROM YOUR ORGANIZATION](#)

Search

[RETURN TO INFO ACCESS OPTIONS](#)
[SITE MAP](#)
[HELP](#)

Select an Existing Code Value Translation

To set up a new Code Value, choose a Data Element and click Create.

To update an existing Code Value, select a Data Element and enter any other desired search criteria, then click Search.

Data Element:
Source:
Source Prefix:
Source From Value:

Click the EDW Description in the table below to select the Code Translation you want to update or delete.

26 records are found with this Data Element. 1-26 are listed below.

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



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The Administrative UI

Translate Code Values from Source Data (academic period)

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Select an Existing Code Value Translation

To set up a new Code Value, choose a Data Element and click Create.

To update an existing Code Value, select a Data Element and enter any other desired search criteria, then click Search.

Data Element:
Source:
Source Prefix:
Source From Value:

Click the EDW Description in the table below to select the Code Translation you want to update or delete.

56 records are found with this Data Element. 1-25 are listed below.

Source	Source Value	EDW Value	EDW Long Description
SunGard HE University of Malvern Pennsylvania	000000	000000	The Beginning of Time
SunGard HE University of Malvern Pennsylvania	198810	198810	Fall 1987
SunGard HE University of Malvern Pennsylvania	198820	198820	Spring
SunGard HE University of Malvern Pennsylvania	198830	198830	Summer 1 1988
SunGard HE University of Malvern Pennsylvania	198840	198840	Summer 2 1988
SunGard HE University of Malvern Pennsylvania	198910	198910	Fall 1988
SunGard HE University of Malvern Pennsylvania	198920	198920	Spring
SunGard HE University of Malvern Pennsylvania	198930	198930	Summer 1 1989



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The Administrative UI

List Events for an EDW Star

Search: [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:

# 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

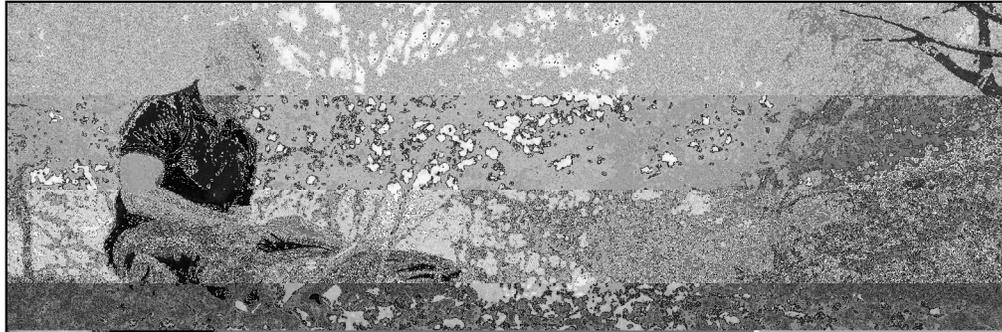
- Oracle users who require an Oracle user account in your source system so they can access the ODS to build reports
- Administrative users who require a user account in the Administrative UI so they can use the UI to maintain the ODS/EDW

Layers

- Reporting tool
- Database objects
- Data values

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





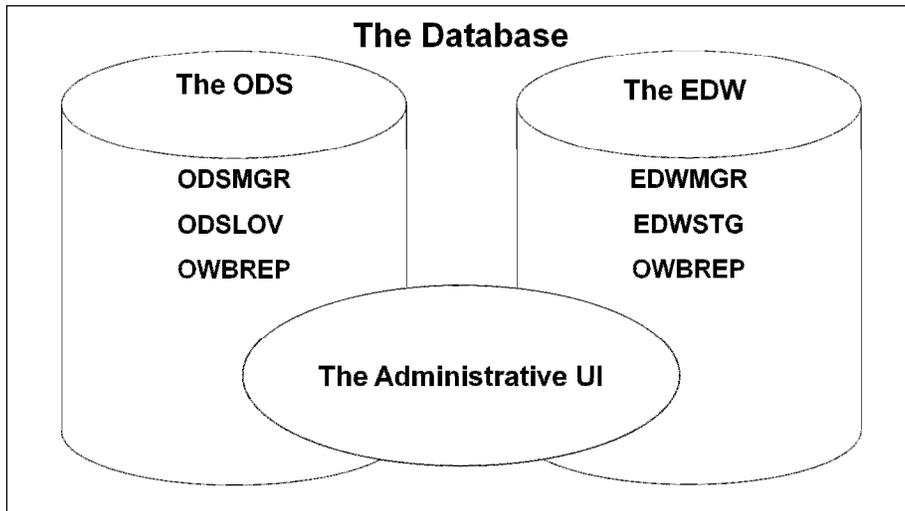
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EDW Architecture

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EDW Architecture

Oracle



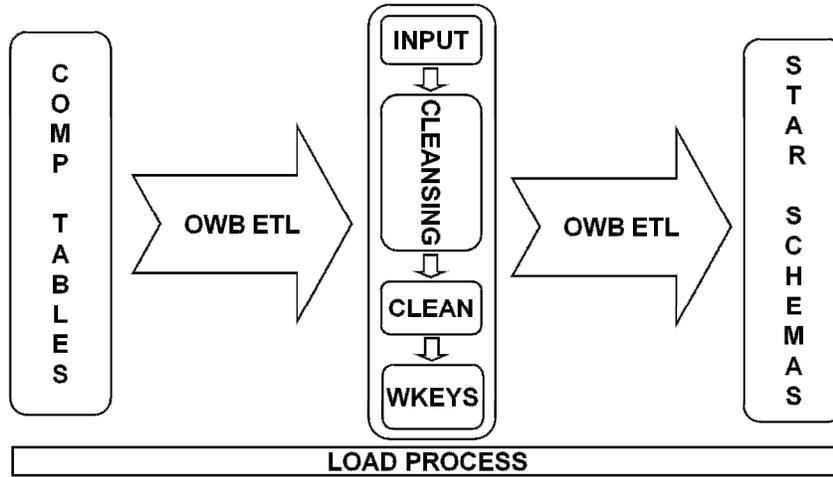
EDW Architecture

The Architecture

ODSMGR

EDWSTG

EDWMGR



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EDW Architecture

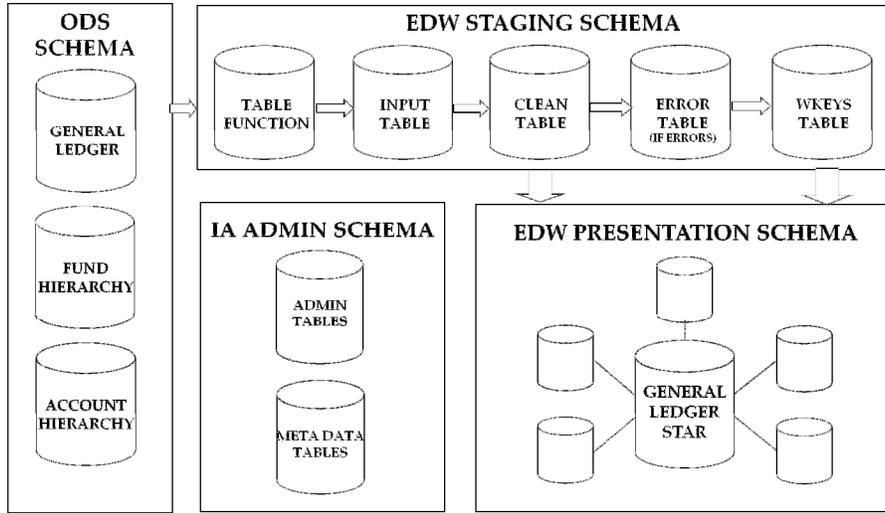
The Load Process

- **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

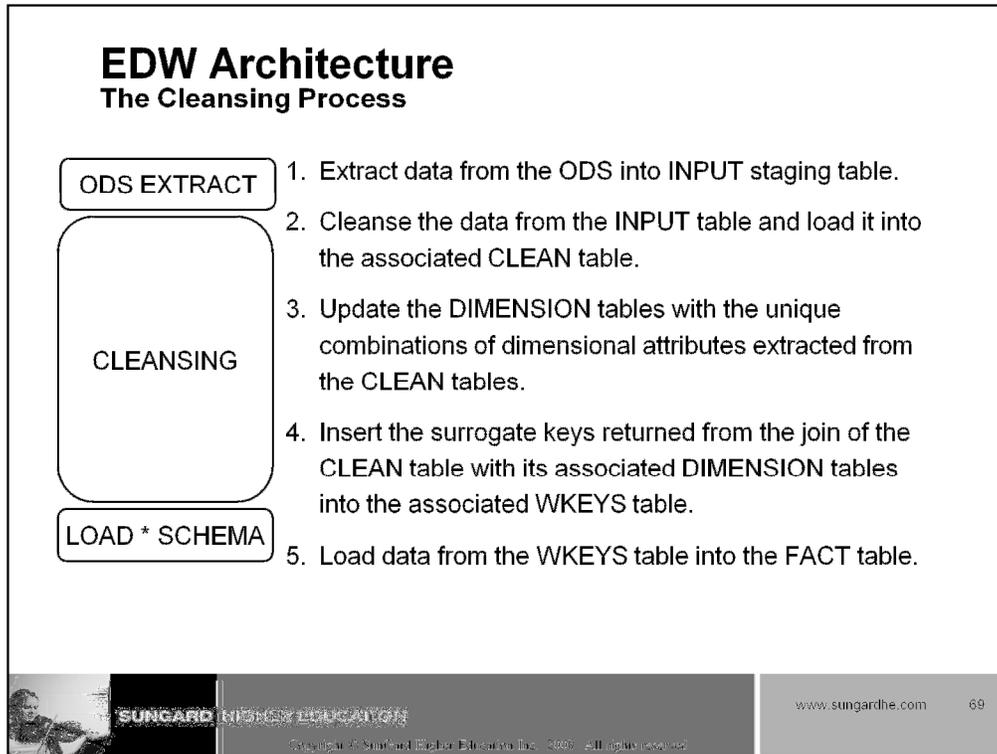


EDW Architecture

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.**

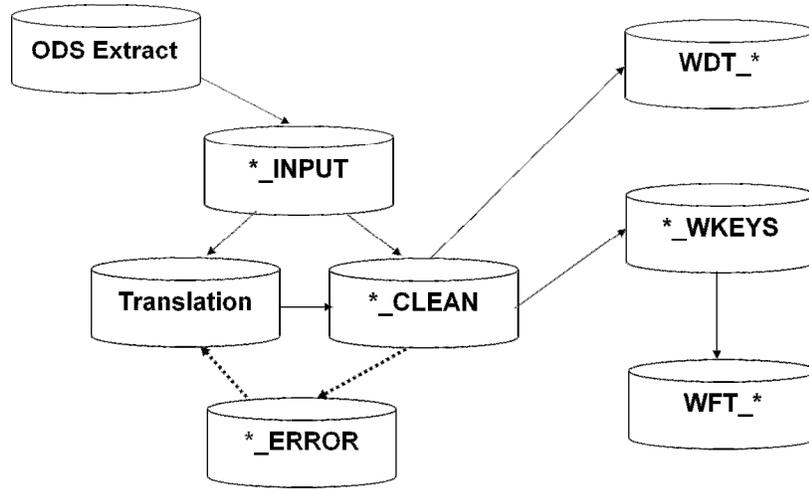




1. Extract data from the ODS based upon parameters passed from the Administrative UI. This data is loaded into the INPUT table associated with the business area being loaded.
2. Load information within the INPUT table to the associated CLEAN table and run the cleansing process. The cleansing process uses values defined by the institution within the Administrative UI to manage descriptions and translate codes to then update them in the CLEAN table.
3. Data from the CLEAN table is then used to discern the unique combinations of dimensional attributes within the data extracted. New combinations of attributes are inserted into their associated dimension tables and assigned a surrogate key. The first dimension analyzed is the time dimension. If the combination of dimensional attributes within the time dimension already exists, the loading process halts unless the Replace Indicator checkbox is checked. This ensures that historical data is not overridden unless explicitly requested by an institution.
4. After loading the attributes into the dimension tables, join the CLEAN table with its various associated dimension tables to obtain the surrogate keys associated with each record. This data is loaded into the associated WKEYS table.
5. Run the FACT_DELETE mapping to delete records in the fact table for the defined time slice when the Replace Indicator checkbox is checked.
6. Load data from the WKEYS table into the fact table.

EDW Architecture

The Cleansing Process



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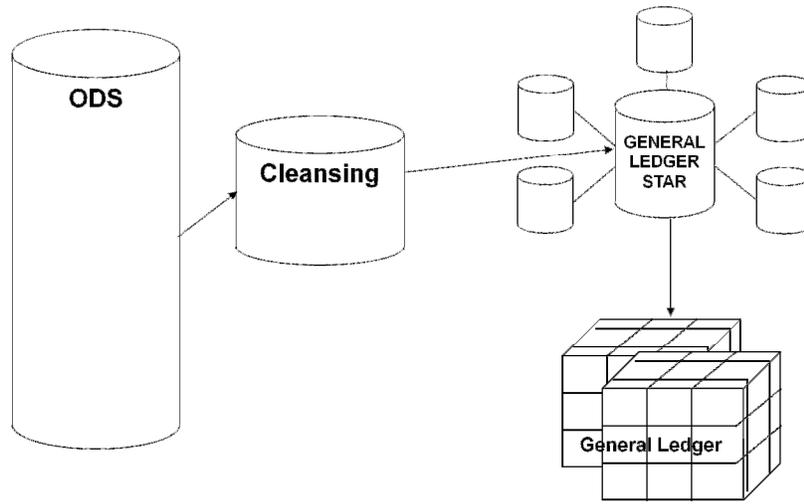
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EDW Architecture

ODS → Cube



EDW Architecture

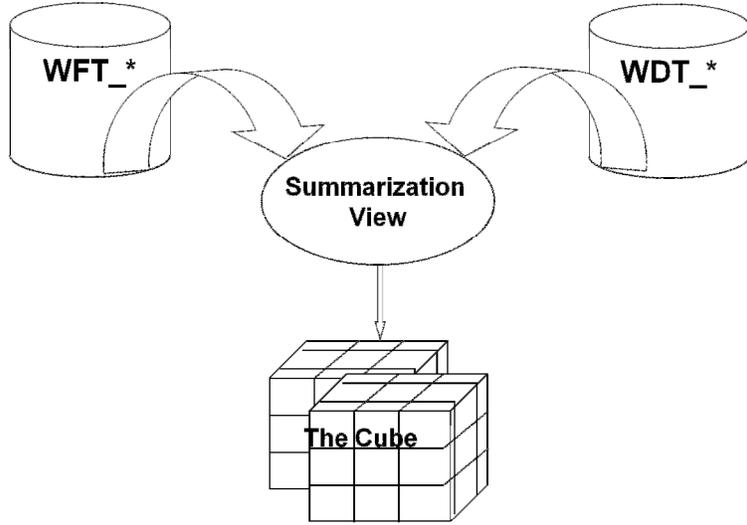
ODS → Cube

- 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



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

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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



EDW Technical Components

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Technical Components

MGRCVL and MGRCDL

- When the EDW is installed, the Load EDW Data Cleansing Values process is run.
 - This loads values into the MGRCVL and MGRCDL 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 MGRCVL and MGRCDL tables.



Technical Components

MGRCVL and MGRCDL

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



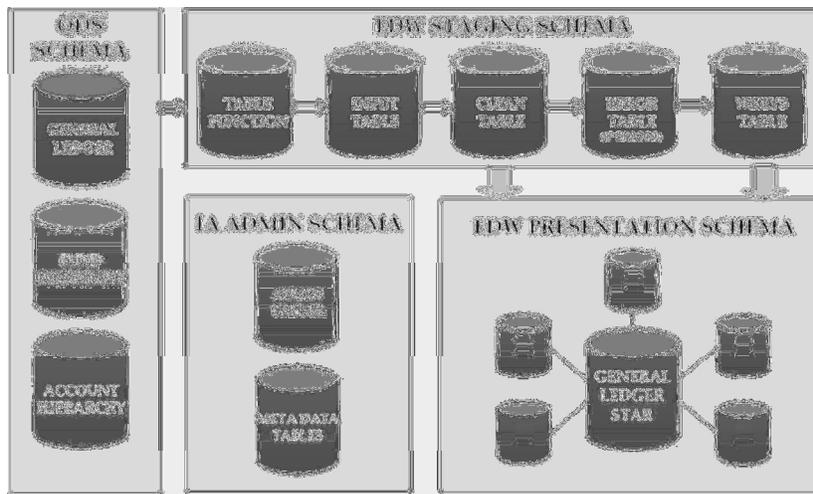
Technical Components

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



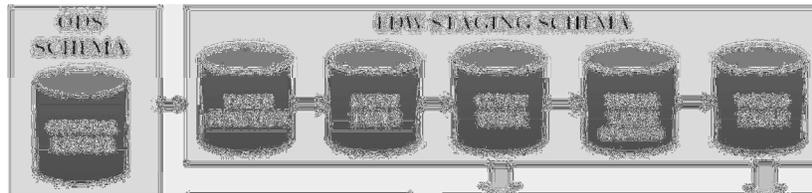
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EDW Technical Components



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



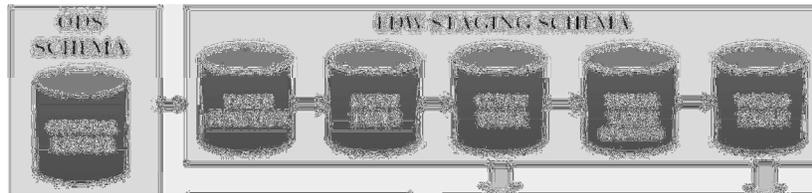
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EDW Technical Components



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



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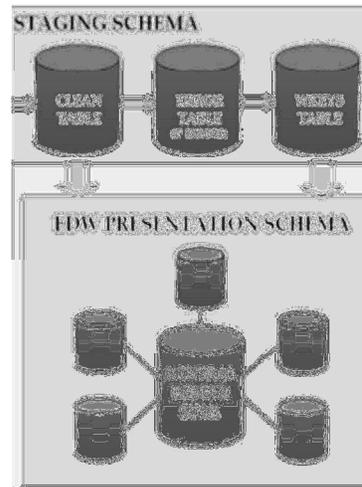
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EDW Technical Components

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**



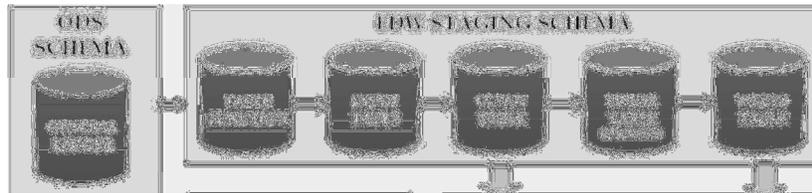
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EDW Technical Components



WKEYS OWB ETL

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



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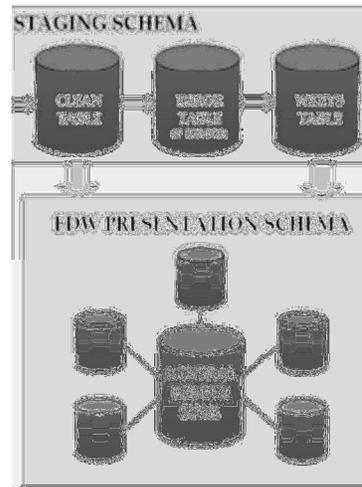
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EDW Technical Components

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**



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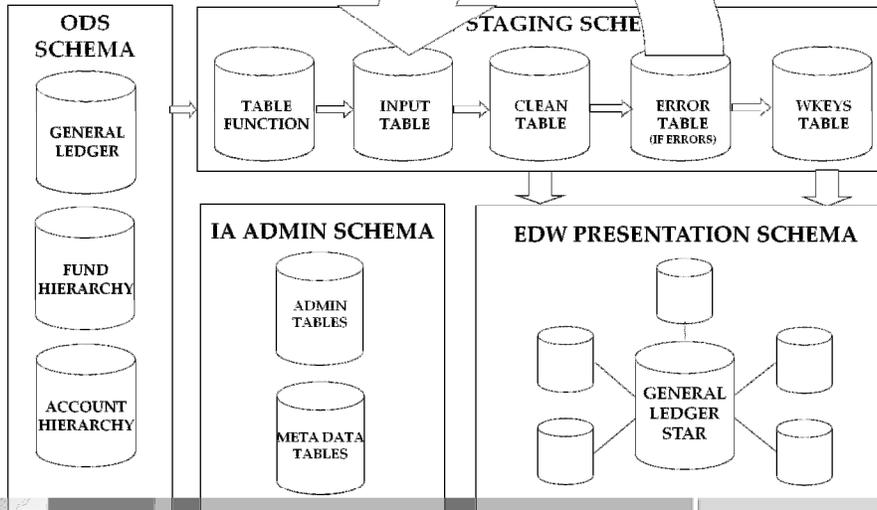
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EDW Technical Components

Snapshot Star Fix Process



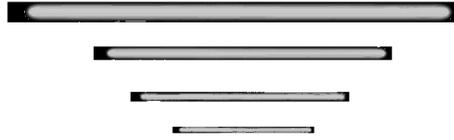
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Questions?



Thanks!
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