#### Fall Conference 2010 Hosted by Oracle November 11, 2010



## Oracle Data Warehousing With Erwin

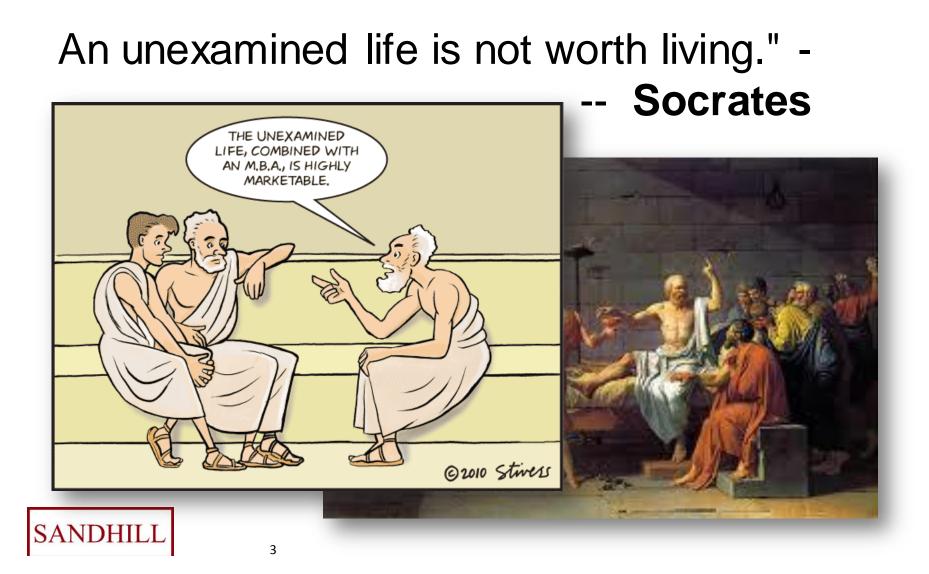
**Donald Soulsby** 

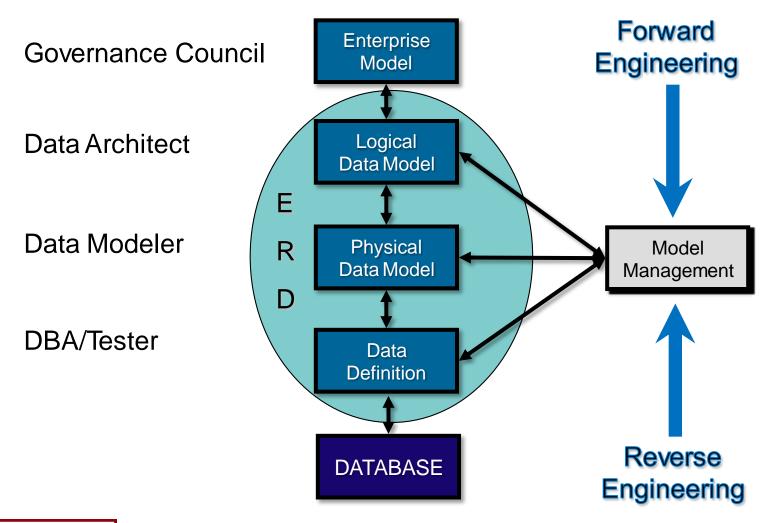




- Dimensional Modeling:
  - Fundamentals
  - Characteristics
  - Modeling functions within CA ERwin Data Modeler
- Erwin model metadata extensions
  - Oracle Warehouse Builder





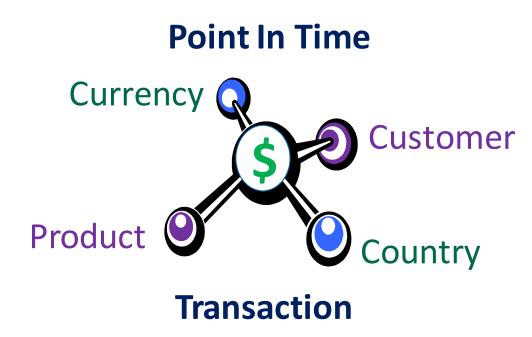




#### Data modeling enables you to:

- provide graphical/lexical documentation of the business area under examination
- follow principles of object reuse (inclusion) by making structures as applicable across enterprise
- permits analysis of data structures in isolation of business processes
- identify areas of agreement and contention between business and technical parties
- evolve an enterprise data foundation/architecture and provide support for model-driven development

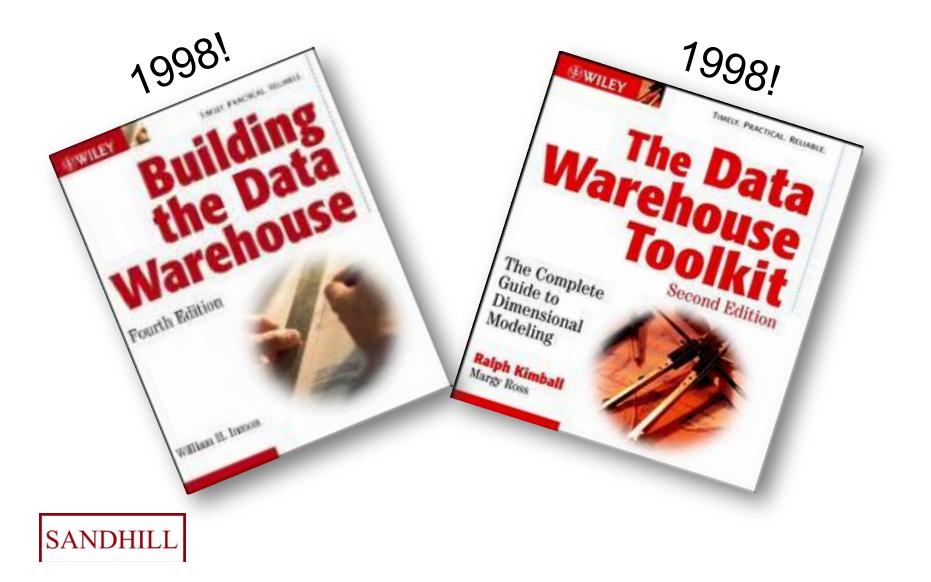




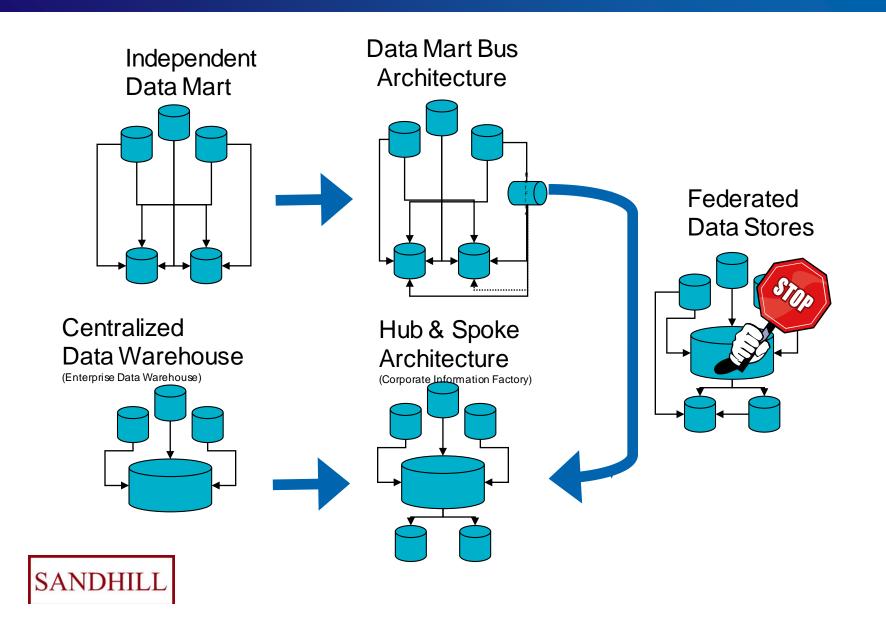
## A Transaction is relationship of Master Data + Reference Files

+ time stamp + volumes + secondary descriptors

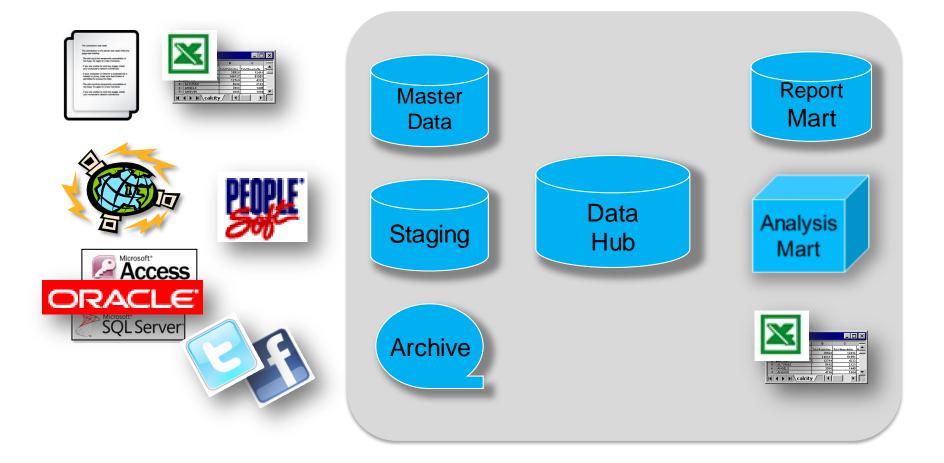




#### **Architecture choices**

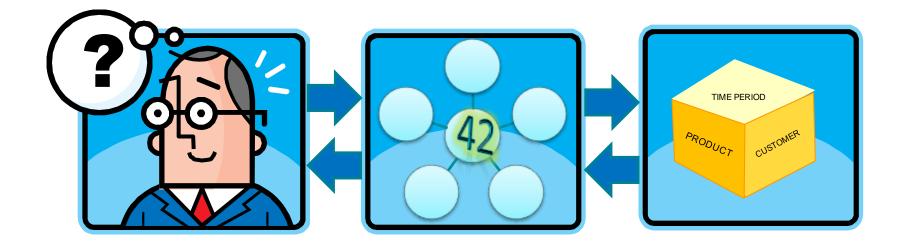


#### **Data Warehousing Models**



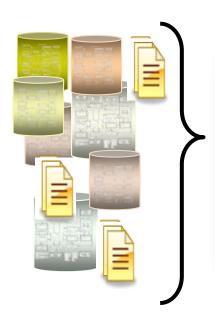


#### **Continuous Insight – Business Intelligence**



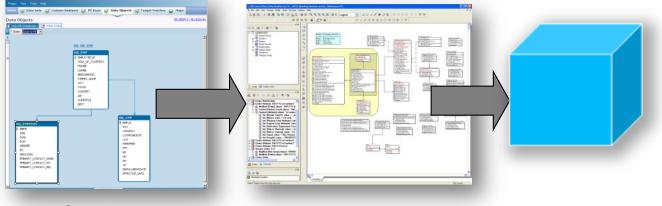


#### **Data Profiling**



#### ERwin Data Profiler

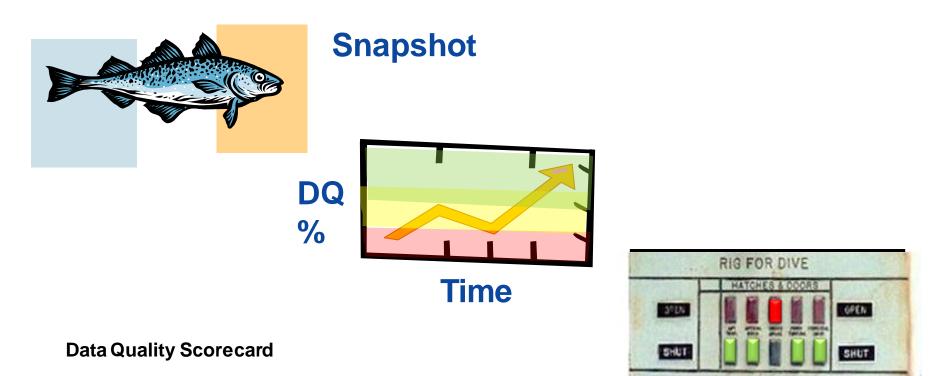
#### ERwin Data Modeler



- Profile data
- Discover primary-foreign keys
- Identify orphan rows
- Find overlapping columns



#### **Data Quality**



	С	Α	т	S
ERP	%	%	%	%
CRM	%	%	%	%



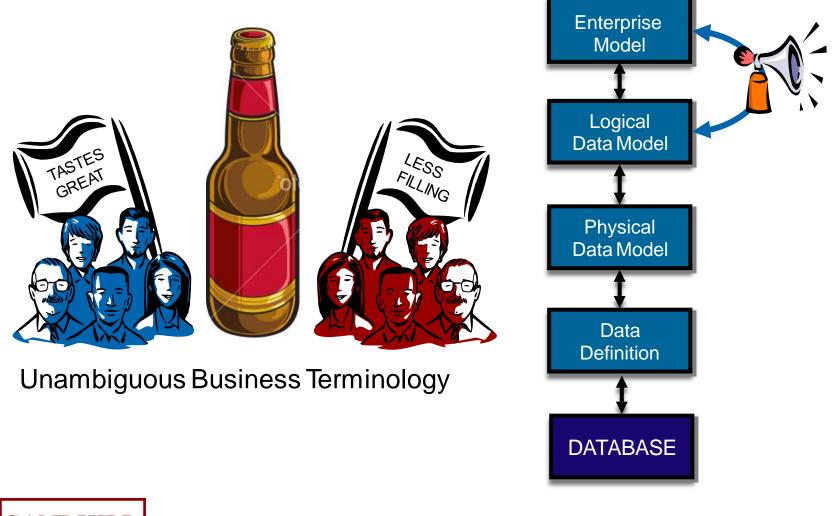


#### Data warehouse modeling enablement

- Conduct a disciplined review of the existing system by the warehouse business and technical experts
- Partition the analysis by subject area to validate scope and objectives (agreement and contention)
- Deliver standards-based documentation of the business and technical warehouse data
- Expose and document the business and technical metadata
- Evolve the enterprise data foundation

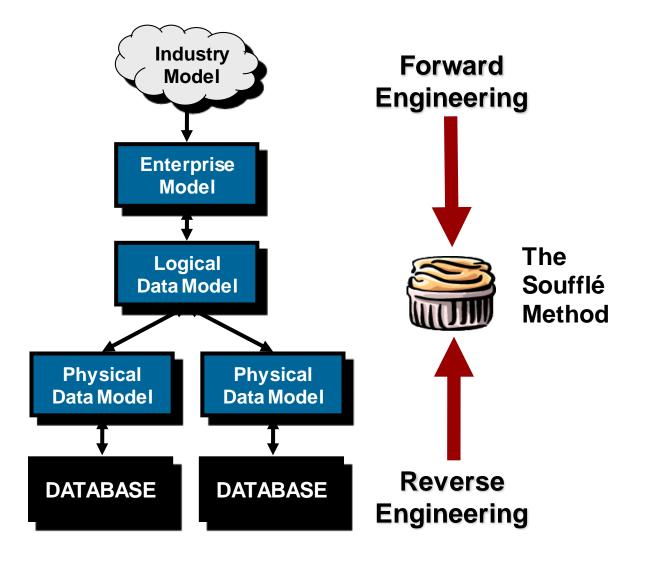


#### **Transformation NOT Translation**



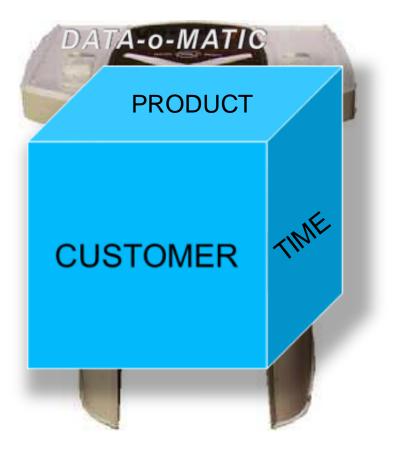


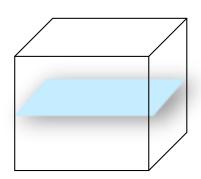
#### **Reference / Master Data Harmonization**

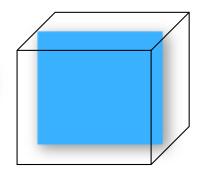


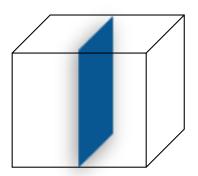


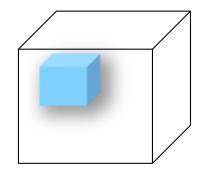
#### The Cube..... It slices, it dices





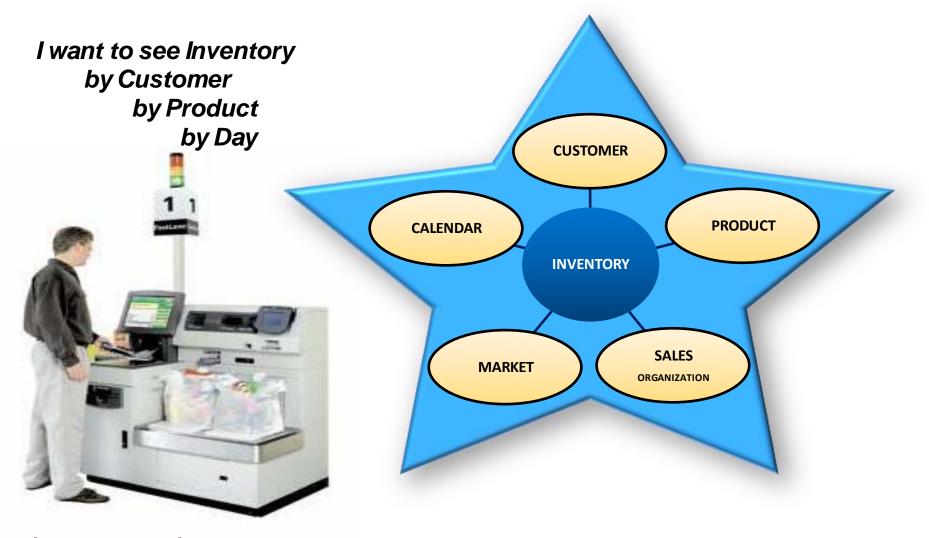






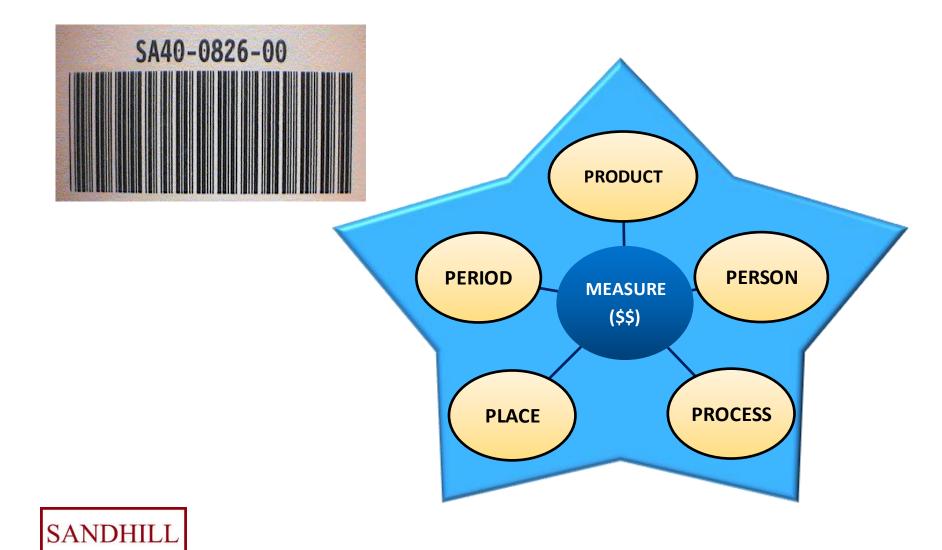


#### **Self-Serve Business Information**

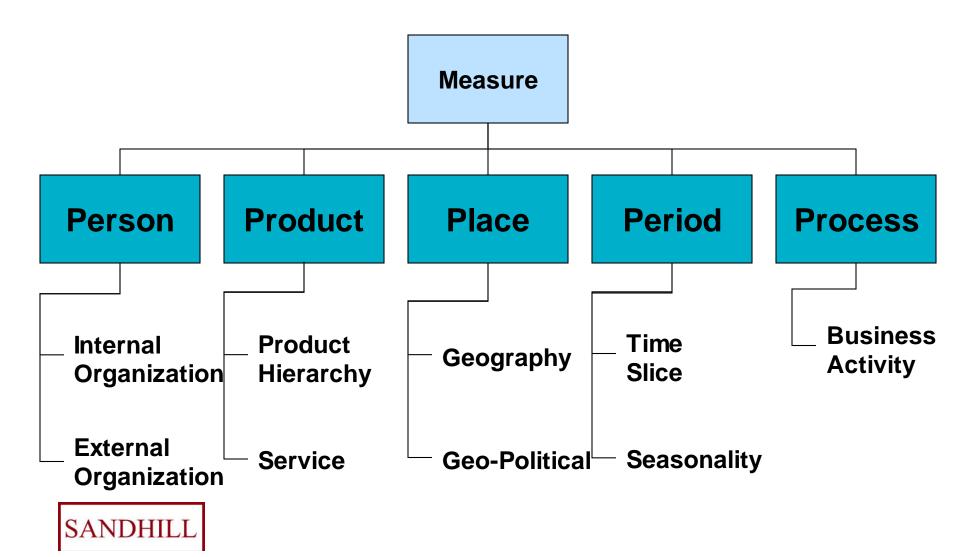


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#### Universal "P" Codes



#### **Generalized Model**

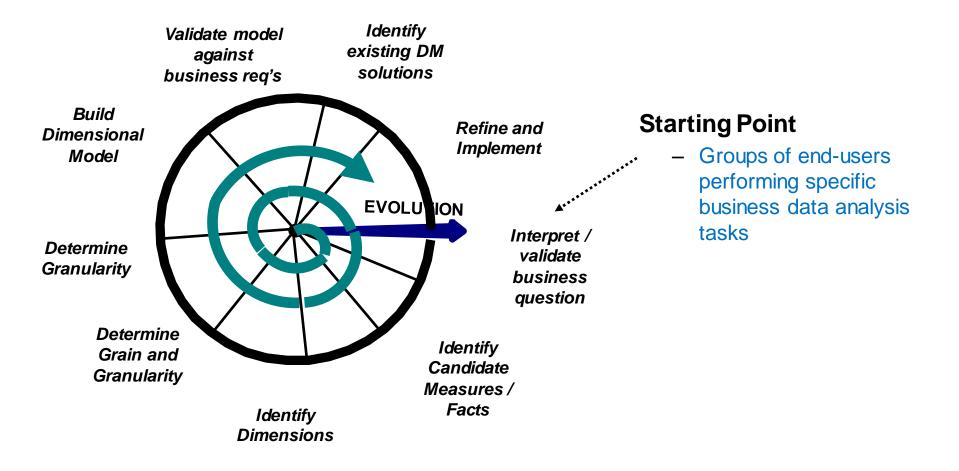


## **Dimensional model application**

- Usage of data within the dimensional model and supporting data mart (or data warehouse)
  - Confirm assumptions and by simple querying
  - Analyze behavior of different players in the business process
  - Answer to non-trivial questions
  - Perform statistical analysis of cross-departmental data
  - Analyze business results in a historical context
  - Use data to discover trends and relationships
  - Use data to help with new decisions in strategic or commercial areas
  - Help to identify functional relationships, in addition to analyzing the broader business processes, such as customer purchase behaviors.



## **Dimensional Modeling Process**





#### **Fundamental activities**

- Identify and interpret the business question
- Identify candidate measures and dimensions
- Identify grains and granularities of the Dimensional Model model
- Identify dimension hierarchies and aggregation levels
- Build the initial normalized Dimensional Model model



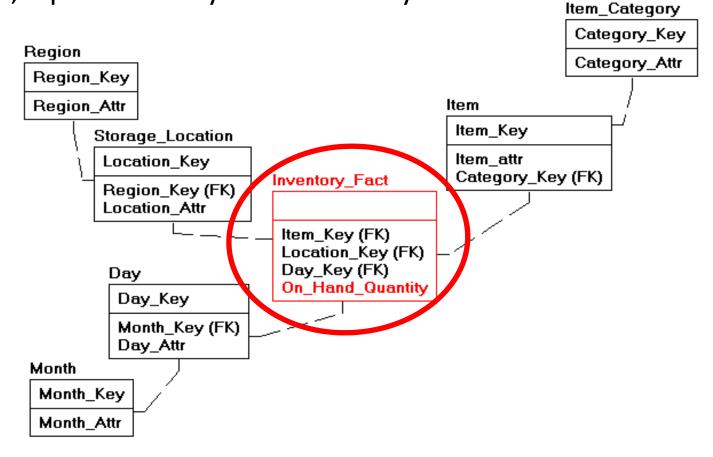
#### **ERwin - activating dimensional features**

Classic model - note physical options

Model Properties	×
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C I <u>E</u> (Information Engineering)	
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C <u>I</u> E (Information Engineering)	
DM (Dimensional Modeling)	
OK	Cancel



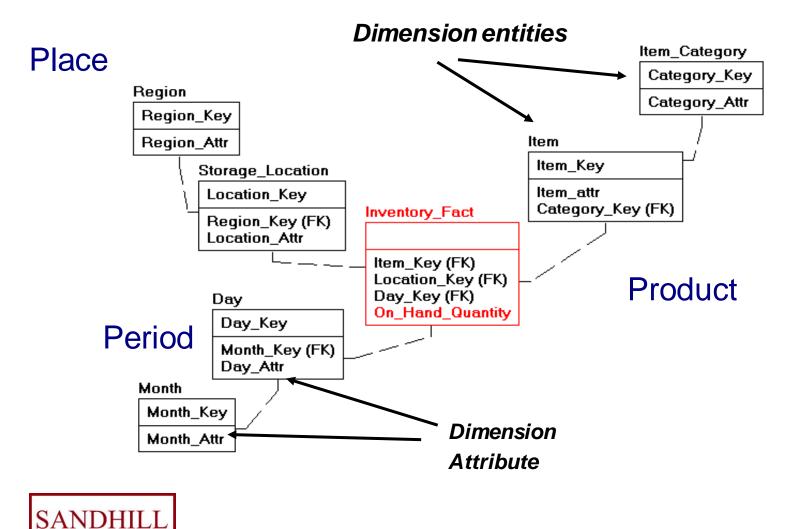
A Fact is a collection of related measures plus their associated dimensions, represented by dimension keys ...





#### Dimension

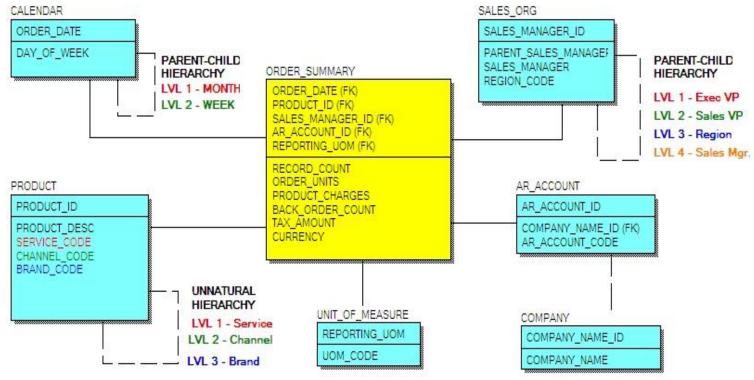
A dimension provides a certain business context to each measure



#### **Dimension Hierarchies**

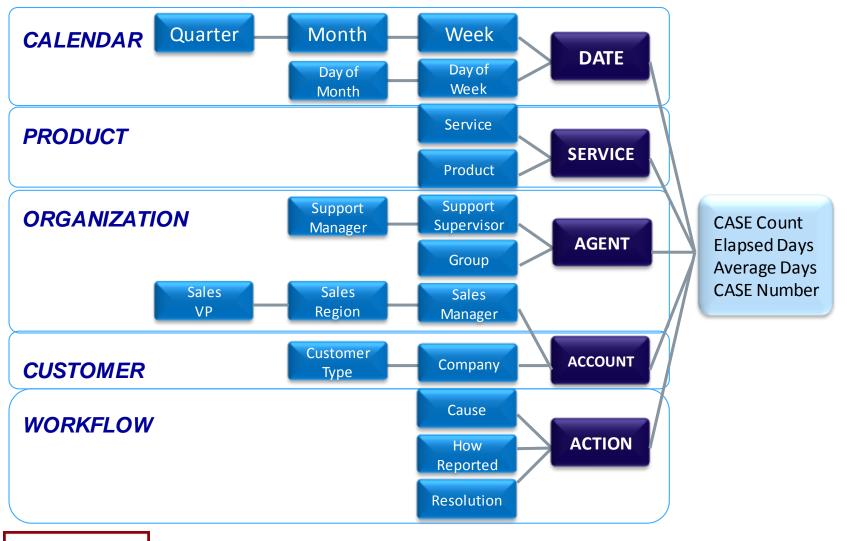
# Dimension entities are related with each other through one or more dimension hierarchies

• Also known as Aggregation paths or Drill hierarchies





#### **Dimensional Model Drilldown**



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**Slowly Changing Dimensions** 

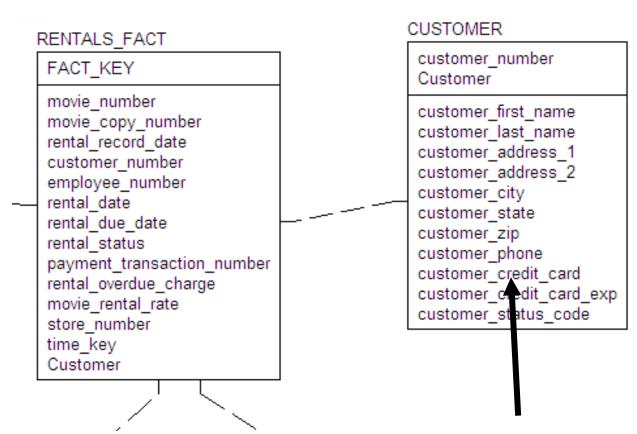
## ₩ J ₩ ₩ J ₩<sup>1</sup> OR ₩ I ₩ A I I ₩ N<sup>2</sup>

1. What is was When it Was

2. What it Was as if it Was Now



## Modeling Slowly-Changing dimensions – Type 1

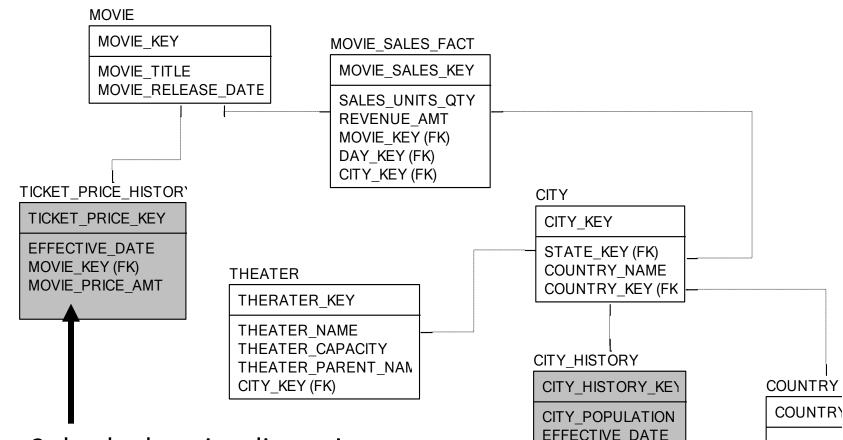


Type 1 slowly changing dimension, value does not change or is deemed to be constant

30

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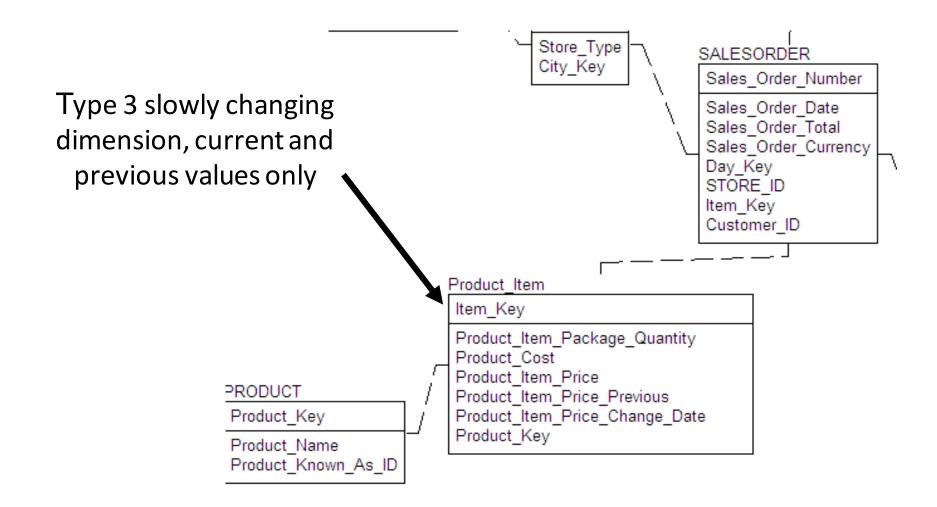
## **Modeling Slowly-Changing Dimensions – Type 2**



Type 2 slowly changing dimension, add more rows

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#### **Modeling Slowly-Changing Dimensions – Type 3**





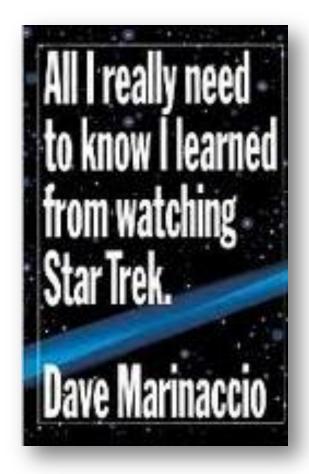
## **ERWin - Slowly Changing Dimensions**

- In the Table properties editor, "Dimensional" tab
  - Check "Slowly Changing"
  - Select type
  - Note Automatic....

ODBC/Generic Tables
Table: SUPPORTED_PRODUCT
Name: SUPPORTED_PRODUCT Owner:
Dimensional Data Movement Comment Volumetrics UDP History Validation
Dimensional Modeling Role         □ Calculate Automatically (based on usage)         □ C Eact       • O Dimension         ○ Dimension       • O Outrigger
Slowly Changing Type 1 Overwrites the old data in the record with the new data. This choice loses the ability to track the old data for the record.
□ Physical Only



#### **Slowly Changing Dimensions**

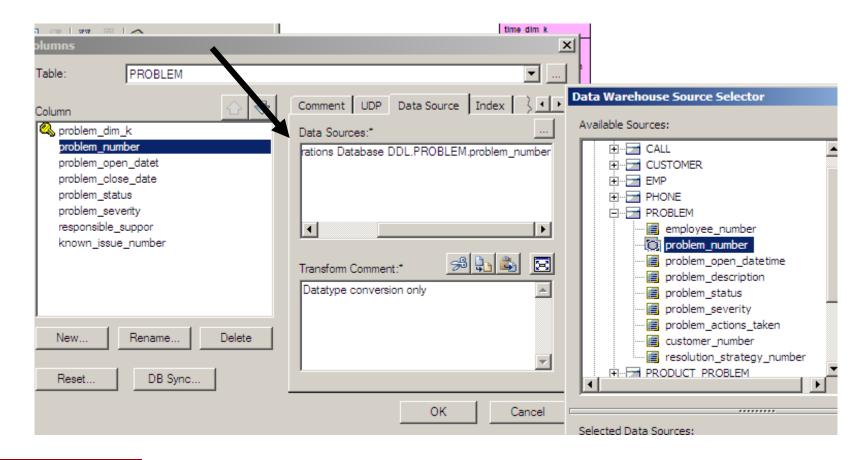






#### **Creating Data Sources**

#### Select the column(s) as source and a transform spec or comment



#### **Creating Column Level UDP**

#### Identify Aggregation Rules

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Column 🔂 🔄	Comment UDP Data Source Index }
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Sproblem_dimension	Property Value
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New Rename Delete	
Reset DB Sync	
	OK Cancel

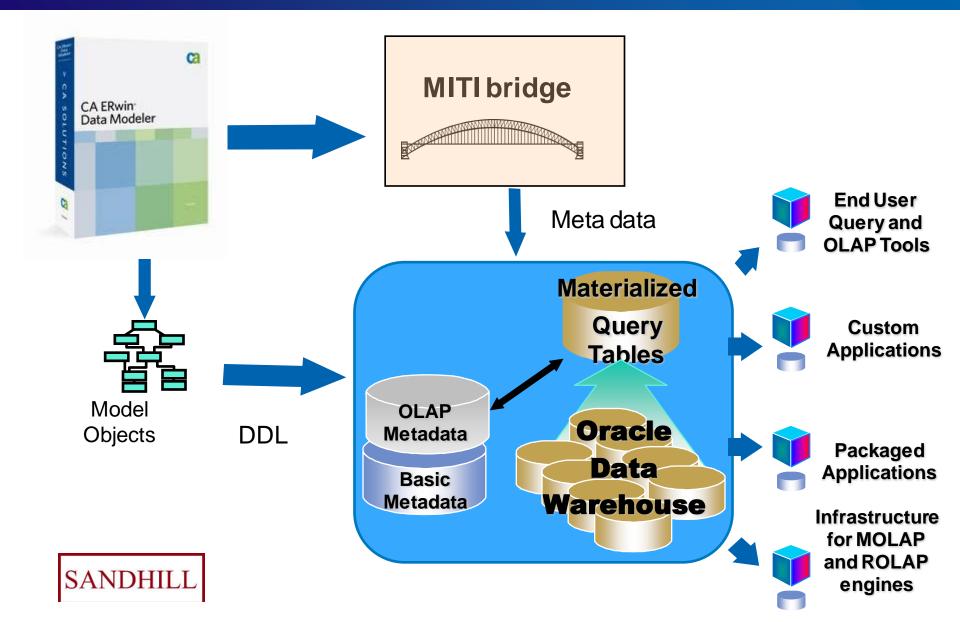
#### **Publish a Data Browser Report**

#### Report on Sales Orders data source

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#### **Meta Integration Bridge - MITI**



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#### Source Model options...

Export to External Format	:		<u>- 0 ×</u>	
Source Select the source data and	the configuration options you want to	o use for the export.		
Overview	Parameters:			
	Parameter	Value		
Source	Import UDPs	As metadata		
Destination	Import relationship name	From relationship name		
	Import IDs	True		
	Import subject areas	Imported as diagrams		
	Import tool: CA ERwin Data Modeler 7.x (http://www.ca.com/us/products/product.aspx?id=260) Import interface: [Data Modeling] Data Store (Physical Data Model, Logical Data Model, Expression Parsing), Graphical Layout via Native (.erwin) or Export (.XML) File from Import bridge: 'CaErwin7Xml' 6.0.5 - Sep 28 2009 17:19:34			
	This bridge will import both .Erwin format files and .XML format files saved using CA AllFusion ERwin Data Modeler versions 7.x.			
	The bridge parses the .XML format files natively. WARNING ONE: The bridge requires the CA AllFusion ERwin Data Modeler COM/OLE API to be installed in order to parse .Erwin format files. Therefore, CA AllFusion ERwin 7 Data Modeler must be properly installed and the specific 💌			
		Finish Cancel	Help	

#### Target Project ... note options

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elect the export data	and configuration options you want to use for the export.		
Overview	Iype: Oracle Warehouse Builder		
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	Dimensional modeling detection Fact tables		
	Dimensional modeling detection Dimension tables	True	
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CWM Options...

Overview	Type: Oracle Warehouse Builder (via	CWM XMI)
Source	Location: D:\OWB-export.xml	
Destination	<u>P</u> arameters:	
	Parameter	Value
	Model	RDB
	CWM version	CWM 1.0
	Schema mapping	Use Packages names
	Default Schema name	
	Export Index of Key	True
	UUIDs	False
	xmlns:CWM	org.omg.CWM1.0
	xmlns:CWMRDB	org.omg.CWM1.0/Relational
	xmlns:CWMOLAP	org.omg.CWM1.0/OLAP
	Metamodel (CWM) XML Metadata Interch metamodel and XMI format, therefore m	nt to the Object Management Group (OMG) Common Warehous ange (XMI) file format. There are multiple versions of the CWM ake sure you generate the appropriate OMG CWM XMI version as accordingly, or select another export bridge version if neces



<b>Export to External Form</b>	at			
Destination Select the export data an	d configuration options you wa	ant to use for the export.		
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	Parameter	Value	<b></b>	
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	🕅 Service	orcl		
	Repository	test export		
	🚩 Project	JC DIM		
	🚩 User	SCOTT		
	Y Password	*****		
	Y OWB Home Path	C:\OraHome_1		
	🚩 Override	False		
	Dimensional modeling	d As defined by source model		
	Enter a semi-colon separated list of tables to be represented as fact tables. This bridge can use the dimensional role that has been specified for each table (fact, dimension) to infer how those tables are converted into BI facts and dimensions when forward-engineering a data model created in a data modeling or ETL tool and forward-engineer to an OLAP/BI model. This parameter manually controls how the tables are assigned the fact dimensional role. For example: dbo.Fact1; Fact2 Finish Cancel Help			
100				

### **ERwin – MITI – OWB Bridge Rules**

# MITI bridge:

- Uses the dimensional role that has been specified for each table (fact, dimension, outrigger) to infer how those tables are converted into BI facts and dimensions
- Table's dimensional role (fact, dimension, outrigger) is to be determined from ERwin and the bridge may makes such a determination, even if the source model did not specify tables dimensional role.



## **ERwin – MITI – OWB Bridge**

- 'As defined by source model' Determine dimensional role only as defined in the source model.
- 'Autodetect from relational schema' Determine dimensional role of fact and dimension tables based on foreign keys.
- The MITI algorithm determines a table to be a:
  - fact table if the table has only incoming foreign keys
  - dimension table if the table has with no foreign key relationships to any other tables
  - dimension table or outrigger table if the table has outgoing foreign keys and depending on the minimum distance (number of foreign key relationships) to a fact table

## Importing Metadata from an Object Management Group CWM

Oracle Warehouse Builder Transfer Wizard

#### **OMG CWM Object**

Package Schema Dimension Level Attribute Hierarchy Cube Measure Table Column Foreign Key Unique Constraint/Primary Key View Column

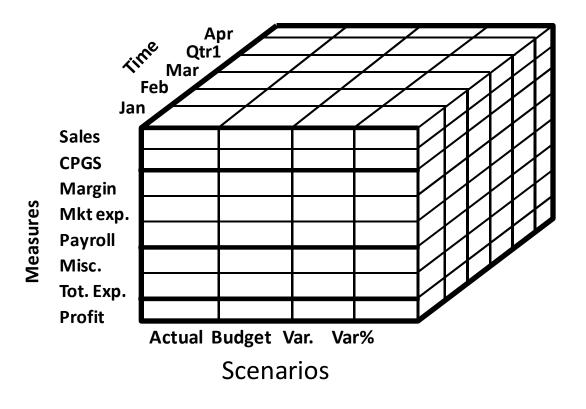
#### **OWB Object**

Project Module Dimension Level Level Attributes Hierarchy Cube Cube Measure Table Column **Foreign Key** Unique Key View Column

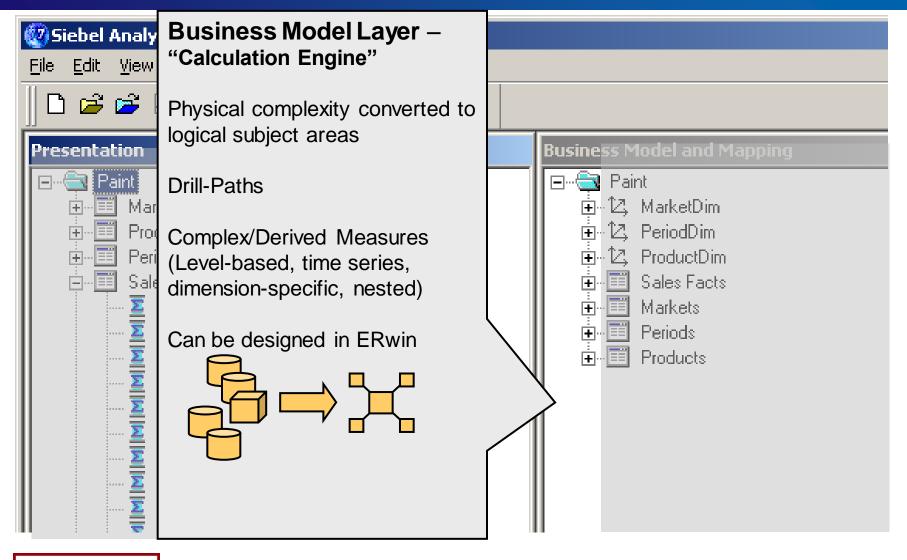


## **Hyperion Storage method**

- Non-relational Stores data in Blocks
- Contents of a block determined by dense dimensions
- Block size affects
  - Data Load time
  - Calculation time
  - Retrieval time



## Oracle 11 BI Suite Enterprise Edition Enterprise Business Model Administration





- ERwin Model objects and metadata that Oracle can leverage:
  - Dimensional Modeling
    - Measures, Dimensions, Facts, and metadata (derivation and usage)
  - ETL mapping
  - Metadata publishing and extension
  - Dimension Hierarchy Characteristics

