IIT School of Applied Technology
ILLINOIS INSTITUTE OF TECHNOLOGY
information technology & management

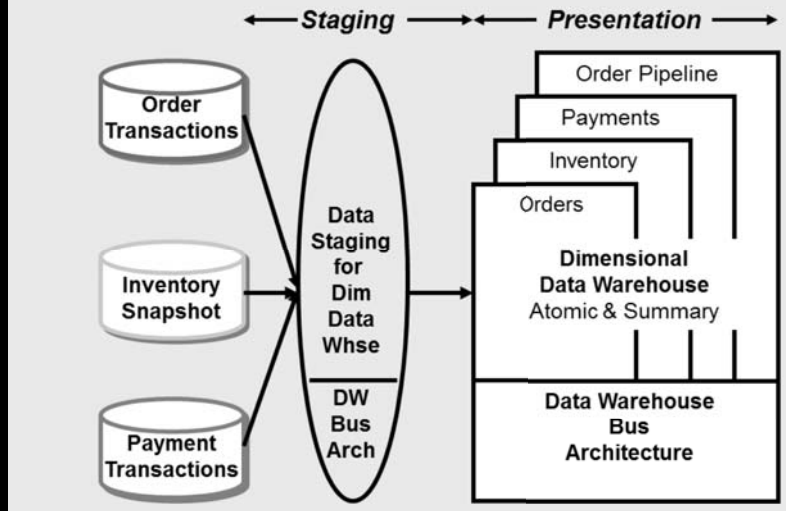
526 Data Warehousing

March 26, 2019
Week 10 Presentation

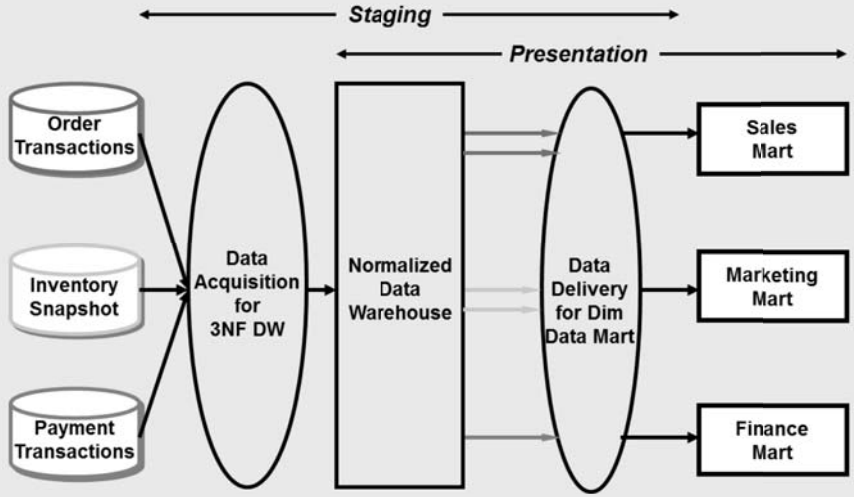
Topics: Integration Via Conformed Dimensions

- We will cover
  - Kimball's and Inmon's Architectures Comparison Revisited
  - Conformed Dimensions
  - Enterprise Data Warehouse Bus Architecture
  - Enterprise Data Warehouse Bus Matrix

Kimball Architecture Revisited



Simplified Hub-and-Spoke Corp Info Factory (CIF) Architecture Revisited



Source: http://www.kimballgroup.com/2004/03/differences-of-opinion/

Conformed Dimensions Tables Shared by Fact Tables

- Each business process typically is represented by one or more fact tables
- Using shared, common dimensions is absolutely critical for data marts integrated seamlessly

Conformed Dimensions

- Identical dimensions conform
- Shrunken rollup dimensions conform
  - Domain values of conform columns must match

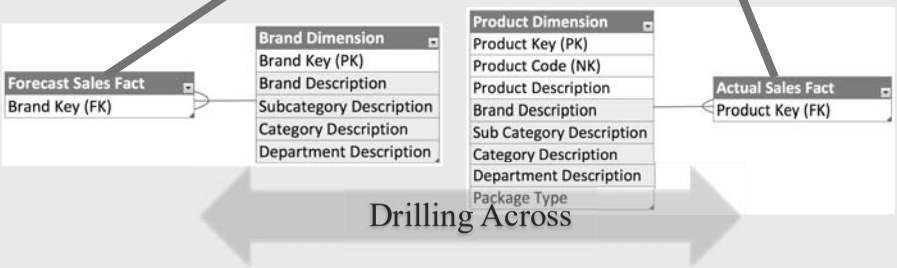
Product Dimension
Product Key (PK)
Product Code (NK)
Product Description
Brand Description
Sub Category Description
Category Description
Department Description
Package Type

Conforms →

Brand Dimension
Brand Key (PK)
Brand Description
Subcategory Description
Category Description
Department Description

Drilling Across Fact Tables via Conformed Dimension Tables

Brand Description	Forecast Sales $ Amount	Actual Sales $ Amount2
UBQTous	$ 1,853.00	$ 1,832.00
SmartIOT	$ 9,932.00	$ 10,234.00
WiggleWorm	$ 3,486.00	$ 2,345.00



- Open separate connection to each source
- Assemble each answer set
- Merge answer sets on conformed row headers

Enterprise Data Warehouse Bus Architecture

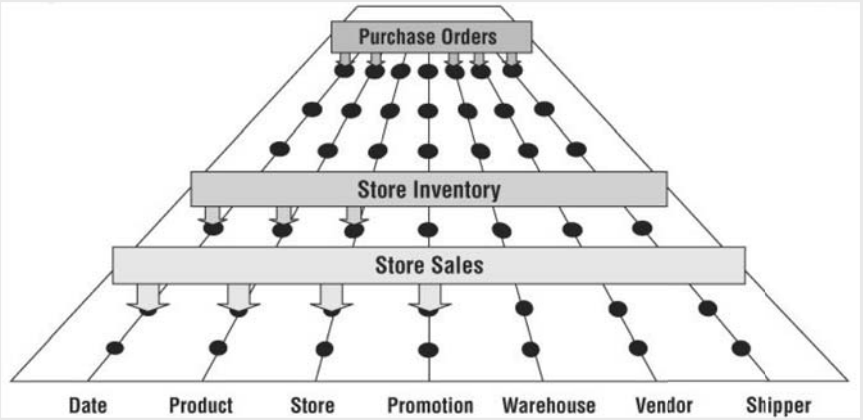


Figure 4.9 Enterprise data warehouse bus with shared dimensions.
Kimball, Ralph; Ross, Margy (2013-07-01). The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling. Wiley. Kindle Edition.

Enterprise Data Warehouse Bus Architecture (cont'd)

- The Enterprise Data Warehouse Bus Architecture provides a standardized master set of conformed dimensions and conformed facts used through the data warehouse
- It is analogous to the bus in your computer, providing a standard interface that allows many different kinds of devices to connect to your computer and co-exist
- Conformed dimensions are standard dimensions that are shared among dimensional models.

Enterprise Data Warehouse Bus Architecture (cont'd)

- The use of conformed dimension is the central technique for building an enterprise data warehouse from a set of dimensional models
- As the separate dimensional models are developed, they plug into the Bus, fitting together like pieces of the puzzle
- Isolated data marts that cannot be tied together are disastrous. Stovepipe data marts merely perpetuate incompatible views of the business

Kimball, Ralph; Ross, Margy. Dimensional Modeling in Depth (41-42). Kimball University.

Enterprise Data Warehouse Bus Matrix

Figure 4.10 Sample enterprise data warehouse bus matrix for a retailer.
Kimball, Ralph; Ross, Margy (2013-07-01). The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling. Wiley. Kindle Edition.

BUSINESS PROCESSES	Date	Product	Warehouse	Store	Promotion	Customer	Employee
Issue Purchase Orders	X	X	X				
Receive Warehouse Deliveries	X	X	X				X
Warehouse Inventory	X	X	X				
Receive Store Deliveries	X	X	X	X			X
Store Inventory	X	X		X			

- Rows translate into fact tables
- Columns represent common dimensions used across the enterprise. Mark the intersections where the dimensions are relevant to the business processes. The resulting matrix will be surprising dense

Enterprise Data Warehouse Bus Matrix (cont'd)

- Sharing conformed dimensions across the data warehouse is absolutely critical
  - Ensures consistent definition of common data
  - Ensures consistent row/column heading labels and roll-ups
  - Ensures consistent "values" for consistently defined dimensions and attributes
  - Reduce time to market
  - Support integration and drilling across fact tables
- Committing to use conformed dimensions is a business policy. It represents more political challenges than technical hurdles

Week 10 Topic: Integration Via Conformed Dimensions

Questions?