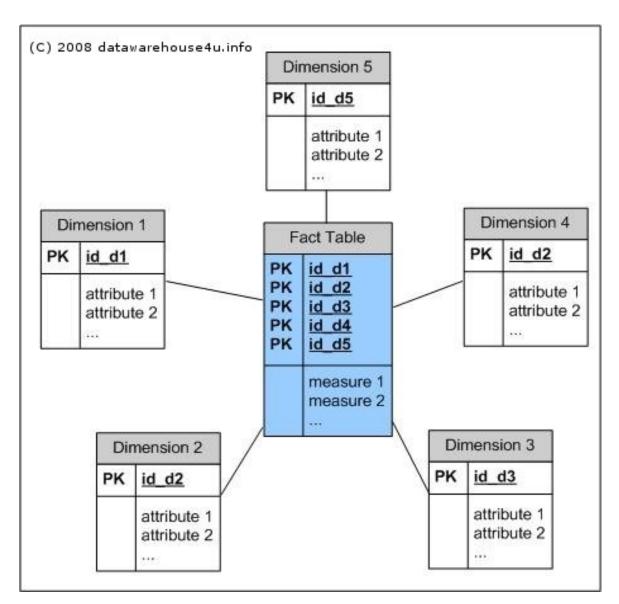
# DISEÑO MULTIDIMENSIONAL

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#### Diseño Multidimensional

Star scheme



### Ejemplo Práctico: Ventas

#### **Date Dimension**

Date Key (PK)

Date

Full Date Description

Day of Week

Day Number in Epoch

Week Number in Epoch

Month Number in Epoch

Day Number in Calendar Month

Day Number in Calendar Year

Day Number in Fiscal Month

Day Number in Fiscal Year

Last Day in Week Indicator

Last Day in Month Indicator

Calendar Week Ending Date

Calendar Week Number in Year

Calendar Month Name

Calendar Month Number in Year

Calendar Year-Month (YYYY-MM)

Calendar Ouarter

Calendar Year-Quarter

Calendar Half Year

Calendar Year

Fiscal Week

Fiscal Week Number in Year

Fiscal Month

Fiscal Month Number in Year

Fiscal Year-Month

Fiscal Quarter

Fiscal Year-Quarter

Fiscal Half Year

Fiscal Year

Holiday Indicator

Weekday Indicator

Selling Season

Major Event

SQL Date Stamp

... and more

#### POS Retail Sales Transaction Fact

Date Key (FK)

Product Key (FK)

Store Key (FK)

Promotion Key (FK)

POS Transaction Number

Sales Quantity

Sales Dollar Amount

Cost Dollar Amount

Gross Profit Dollar Amount

#### **Promotion Dimension**

Promotion Key (PK)

Promotion Name

Price Reduction Type

Promotion Media Type

Ad Type

Display Type

Coupon Type

Ad Media Name

Display Provider

Promotion Cost

Promotion Begin Date
Promotion End Date

... and more

#### Product Dimension

Product Key (PK)

Product Description

SKU Number (Natural Key)

Brand Description

Category Description

Department Description

Package Type Description

Package Size

Fat Content

Diet Type

Weight

Weight Units of Measure

Storage Type

Shelf Life Type Shelf Width

Shelf Width

Shelf Depth

... and more

#### Store Dimension

Store Key (PK)

Store Name

Store Number (Natural Key)

Store Street Address

Store City

Store County

Store State

Store Zip Code

Store Manager

Store District

Store Region

Floor Plan Type

Photo Processing Type

Financial Service Type

Selling Square Footage

Total Square Footage

First Open Date

... and more

Last Remodel Date

## Dimensiones, ejemplos de valores

Date Key	Date	Full Date Description	Day of Week	Calendar Month	Calendar Year	Fiscal Year- Month	Holiday Indicator	Weekday Indicator
1	01/01/2002	January 1, 2002	Tuesday	anuary	2002	F2002-01	Holiday	Weekday
2	01/02/2002	January 2, 2002	Wednesday	anuary	2002	F2002-01	Non-Holiday	Weekday
3	01/03/2002	January 3, 2002	Thursday	January	2002	F2002-01	Non-Holiday	Weekday
4	01/04/2002	January 4, 2002	Friday	anuary	2002	F2002-01	Non-Holiday	Weekday
5	01/05/2002	January 5, 2002	Saturday	January	2002	F2002-01	Non-Holiday	Weekend
6	01/06/2002	January 6, 2002	Sunday	January	2002	F2002-01	Non-Holiday	Weekend
7	01/07/2002	January 7, 2002	Monday	January	2002	F2002-01	Non-Holiday	Weekday
8	01/08/2002	January 8, 2002	Tuesday	January	2002	F2002-01	Non-Holiday	Weekday

Product Key	Product Description	Brand Description	Category Description	Department Description	Fat Content
1	Baked Well Light Sourdough Fresh Bread	Baked Well	Bread	Bakery	Reduced Fat
2	Fluffy Sliced Whole Wheat	Fluffy	Bread	Bakery	Regular Fat
3	Fluffy Light Sliced Whole Wheat	Fluffy	Bread	Bakery	Reduced Fat
4	Fat Free Mini Cinnamon Rolls	Light	Sweeten Bread	Bakery	Non-Fat
5	Diet Lovers Vanilla 2 Gallon	Coldpack	Frozen Desserts	Frozen Foods	Non-Fat
6	Light and Creamy Butter Pecan 1 Pint	Freshlike	Frozen Desserts	Frozen Foods	Reduced Fat
7	Chocolate Lovers 1/2 Gallon	Frigid	Frozen Desserts	Frozen Foods	Regular Fat
8	Strawberry Ice Creamy 1 Pint	lcy	Frozen Desserts	Frozen Foods	Regular Fat
9	Icy Ice Cream Sandwiches	lcy	Frozen Desserts	Frozen Foods	Regular Fat

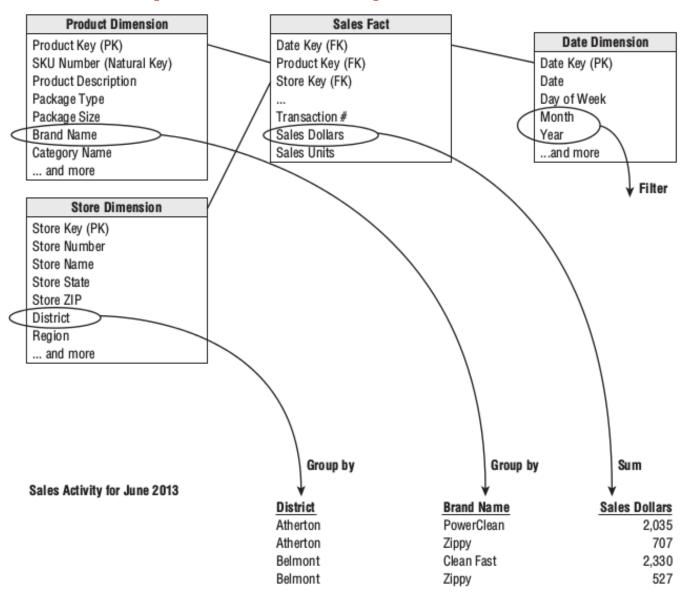
## Hechos, ejemplos drill-down

Department Description	Sales Dollar Amount	Sales Quantity
Bakery	\$12,331	5,088
Frozen Foods	\$31,776	15,565



Department Description	Brand Description	Sales Dollar Amount	Sales Quantity
Bakery	Baked Well	\$3,009	1,138
Bakery	Fluffy	\$3,024	1,476
Bakery	Light	\$6,298	2,474
Frozen Foods	Coldpack	\$5,321	2,640
Frozen Foods	Freshlike	\$10,476	5,234
Frozen Foods	Frigid	\$7,328	3,092
Frozen Foods	Icy	\$2,184	1,437
Frozen Foods	QuickFreeze	\$6,467	3,162

### Ejemplo de reporte simple



### Diseño dimensional en 4 pasos

- 1. Seleccionar el proceso de negocio
- 2. Definir la granularidad
  - Atomic grain
  - Granularidades distintas de análisis no deben ir en una misma tabla de hechos
- 3. Identificar las dimensiones
- 4. Identificar los hechos

#### **Dimensiones**

- "who, what, where, when, why, and how"
- Atributos descriptivos utilizados para el filtrado y la agrupación de los hechos (facts)
- Clave subrogada y clave natural
- Diferentes tipos de dimensiones, según:
  - Periodicidad de cambios
  - Diseño funcional

### Clave subrogada y Natural

- Subrogada: PK único de cada registro en una tabla de dimensión
- Natural: PK en origen de datos

### Clave subrogada y Natural

- Subrogada: PK único de cada registro en una tabla de dimensión
- Natural: PK en origen de datos

#### Ventajas:

- Integración con múltiples orígenes de datos
- Desempeño, PKs y FKs simples, no compuestas
- Valores especiales para casos nulos o de error
- Soporta tracking de cambios en los registros

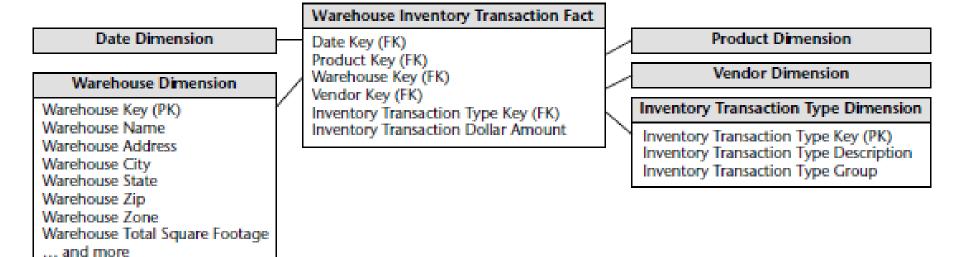
#### Tipos de Dimensiones

- Slowly Changing
  - Tipo 1: update del registro
  - Tipo 2: versionado (insert más atributo nuevo versión)
  - Tipo 3: campos adicionales (created, updated)
  - Tipo 4: tabla actual y tabla histórica
- Rapid Changing
  - Separar en una mini dimensión
- Junk Dimension

#### Tablas de Hechos

- Transactional
- Periodic Snapshot
- Accumulating Snapshot

# Diseño: Transactional Ej: Inventario



#### Características:

- \* Orientado a transacciones
- \* 1 hecho por transacción

### Diseño: Periodic Snapshot Ej: Inventario

#### Date Dimension Product Dimension Store Inventory Snapshot Fact Date Key (PK) Date Key (FK) Product Key (PK) Date Attributes ... Product Key (FK) Product Attributes ... Store Key (FK) Quantity on Hand Quantity Sold Store Dimension Dollar Value at Cost Store Key (PK) Dollar Value at Latest Selling Price Store Attributes ....

#### **Características:**

- \* Orientado a medir niveles periódicamente
- \* 1 hecho por medición (ej: medición diaria de stock de productos)

# Diseño: Accumulating Snapshot Ej: Inventario

Date Received Dimension

**Date Inspected Dimension** 

Date Placed in Inventory Dimension

Date Authorized to Sell Dimension

**Date Picked Dimension** 

**Date Boxed Dimension** 

Date Shipped Dimension

Date of Last Return Dimension

Warehouse Inventory Accumulating Fact

Date Received Key (FK)

Date Inspected Key (FK)

Date Placed in Inventory Key (FK)

Date Authorized to Sell Key (FK)

Date Picked Key (FK)

Date Boxed Key (FK)

Date Shipped Key (FK)

Date of Last Return Key (FK)

Product Key (FK)

Warehouse Key (FK)

Vendor Key (FK)

Quantity Received

Quantity Inspected

Quantity Returned to Vendor

Quantity Placed in Bin

Quantity Authorized to Sell

Quantity Picked

Quantity Boxed

Quantity Shipped

Quantity Returned by Customer

Quantity Returned to Inventory

Quantity Damaged

Quantity Lost

Quantity Written Off

Unit Cost

Unit List Price

Unit Average Price

Unit Recovery Price

**Product Dimension** 

Warehouse Dimension

Vendor Dimension

#### Características:

\* Orientado a un proceso

\* 1 hecho por proceso, atributos se actualizan cuando hay un cambio de estado

#### Referencias

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