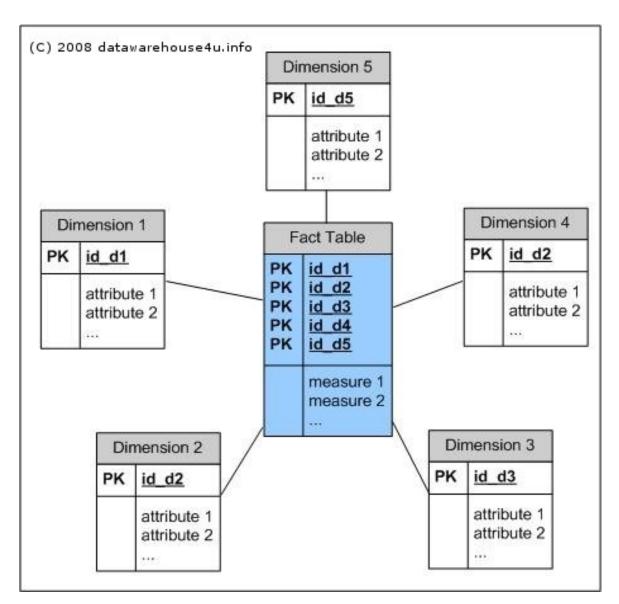
DISEÑO MULTIDIMENSIONAL

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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 Height

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

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 |

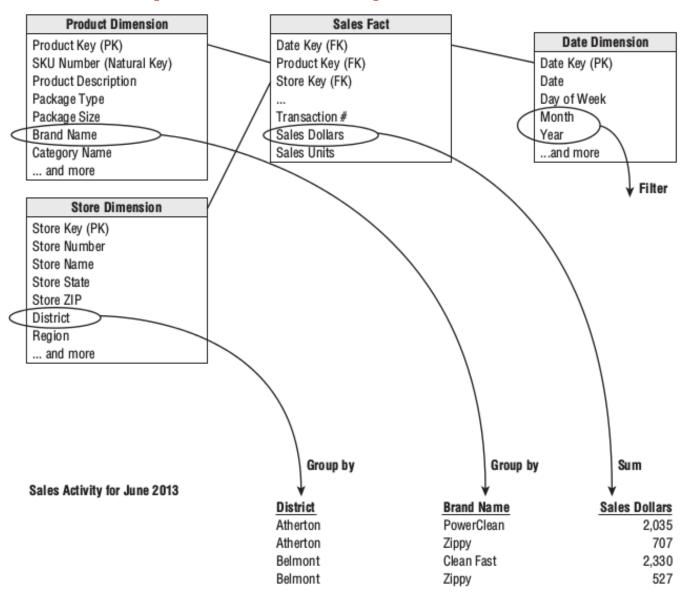
Hechos, ejemplos drill-down

| 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 (overwrite)
 - Tipo 2: versionado (insert más atributo nuevo versión)
 - Campos adicionales (created, updated)
 - Tipo 3: nuevo atributo
 - Tipo 4: tabla actual y tabla histórica
- Rapid Changing
 - Separar en una mini dimensión
- Junk Dimension

Tipo 1: overwrite

Original row in Product dimension:

| Product | SKU (NK) | Product | Department |
|---------|----------|-------------|------------|
| Key | | Description | Name |
| 12345 | ABC922-Z | IntelliKidz | Education |

Updated row in Product dimension:

| Product | SKU (NK) | Product | Department |
|---------|----------|-------------|------------|
| Key | | Description | Name |
| 12345 | ABC922-Z | IntelliKidz | Strategy |

Tipo 2: versionado

Original row in Product dimension:

| Product Key | SKU (NK) | Product Description | Department Name | Row Effective Date | Row Expiration Date | Current Row Indicator |
|----------------|----------|------------------------|--------------------|------------------------------|---------------------------|--------------------------|
| 12345 | ABC922-Z | IntelliKidz | Education | 2012-01-01 | 9999-12-31 | Current |

Rows in Product dimension following department reassignment:

| Product Key | SKU (NK) | Product Description | Department Name | : | Row Effective Date | Row Expiration Date | Current Row Indicator |
|----------------|----------|------------------------|--------------------|---|--------------------------|---------------------------|--------------------------|
| 12345 | ABC922-Z | IntelliKidz | Education | | 2012-01-01 | 2013-01-31 | Expired |
| 25984 | ABC922-Z | IntelliKidz | Strategy | | 2013-02-01 | 9999-12-31 | Current |

Tipo 1 y 2: update + versionado

Original row in Product dimension:

| Product Key | SKU (NK) | Product Description | Department Name | Introduction Date | Row Effective Date | Row Expiration Date | Current Row Indicator |
|----------------|----------|------------------------|--------------------|----------------------|------------------------------|---------------------------|--------------------------|
| 12345 | ABC922-Z | IntelliKidz | Education | 2012-12-15 | 2012-01-01 | 9999-12-31 | Current |

Rows in Product dimension following type 2 change to Department Name and type 1 change to Introduction Date:

| Product Key | SKU (NK) | Product Description | Department Name | Introduction Date | Row Effective Date | Row Expiration Date | Current Row Indicator |
|----------------|----------|------------------------|--------------------|----------------------|------------------------------|---------------------------|--------------------------|
| 12345 | ABC922-Z | IntelliKidz | Education | 2012-01-01 | 2012-01-01 | 2013-01-31 | Expired |
| 25984 | ABC922-Z | IntelliKidz | Strategy | 2012-01-01 | 2013-02-01 | 9999-12-31 | Current |

Tipo 3: nuevo atributo

Original row in Product dimension:

| Product Key | SKU (NK) | | Department Name |
|----------------|----------|-------------|--------------------|
| 12345 | ABC922-Z | IntelliKidz | Education |

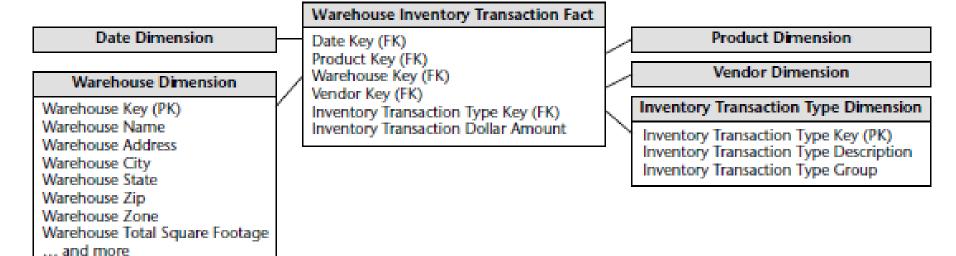
Updated row in Product dimension:

| Product Key | SKU (NK) | Product Description | Department Name | Prior Department Name |
|----------------|----------|------------------------|--------------------|-----------------------------|
| 12345 | ABC922-Z | IntelliKidz | Strategy | Education |

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



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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