

Temporal Fact Tables

The Road Less Traveled

Martin Schoombbee



About Me

- Senior BI Consultant at Insight
- MCITP – **BI Developer 2008**
- Blog – **www.did-i-say-that.com**
- Twitter – **@sqlmartin**
- SpeakerRate – **Martin Schoombee**

Agenda

- What is it?
- Why would I need it?
- How do I do it?
- Will it work?

What is it?

- Temporal: “...of or relating to time”
- Data Compression Technique
- Specific Implementation of a Fact Table

Real-World Example

- Price Modeling Tool for Retailer
- Track Attributes of Products Over Time
 - Cost
 - Retail Price
 - Coupons (Buy 2, Get One Free)
 - Movement (Avg. Sales Over Time)
- Question
 - Attributes of a Product on Any Given Day?

Type 2 Dimension?

Type-2 Dimension Approach

- Products Priced by Store
 - Changes Grain of Dimension
 - 800K (P) * 200 (S) = **160M Records**
- Type-2 Changes
 - 30% of Products on Sale per Week
 - 160M Records * 30% = **48M Type-2 Changes per Week**
 - **2.5B** Type-2 Changes per Year

Type-2 Dimension Approach

- Pro's
 - Dimensions Used for Attributes
- Con's
 - 2 Dimensions Combined
 - Changes Too Volatile
 - Fact-less Fact Table with Same Record Counts
 - Not Flexible

Periodic Snapshot?

Periodic Snapshot Approach

- Separate Dimensions

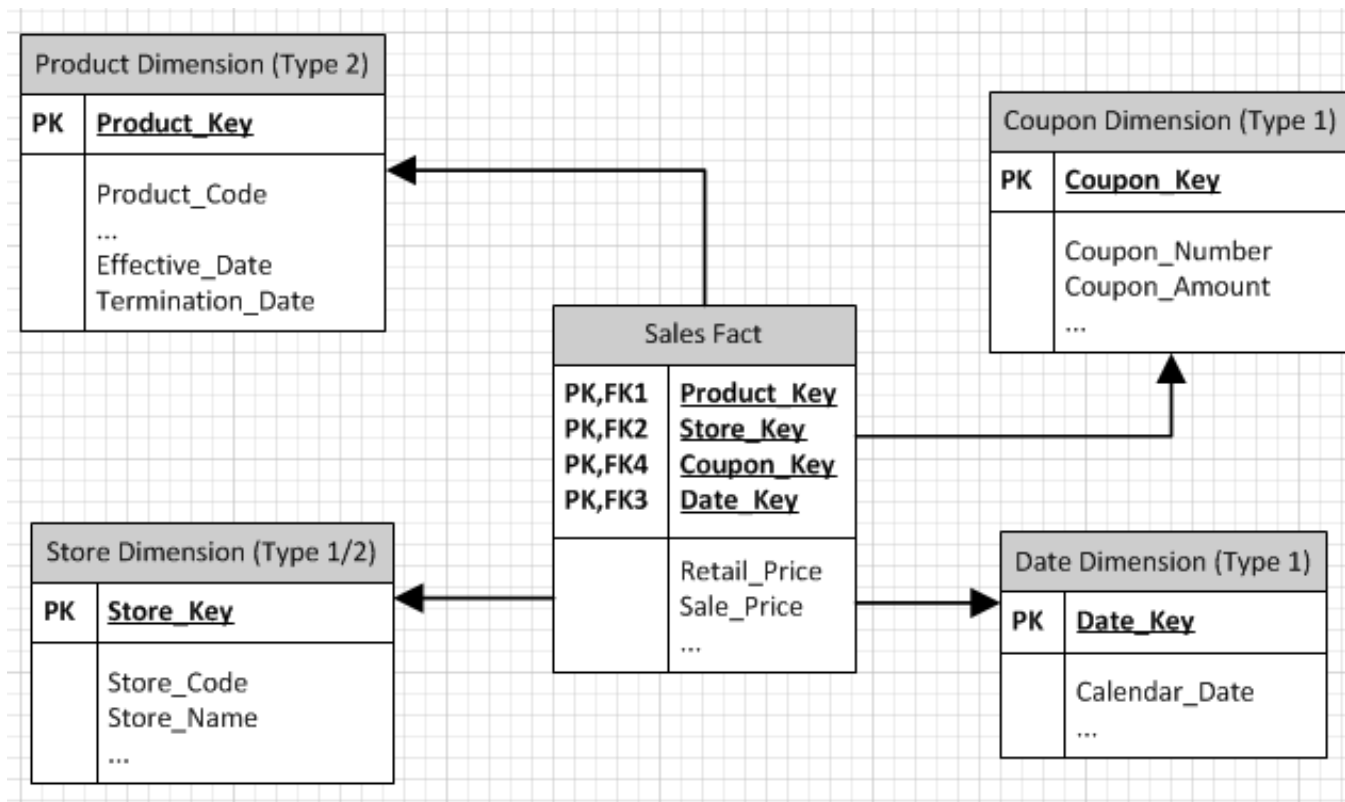
Product Dimension (Type 2)	
PK	<u>Product_Key</u>
	Product_Code ... Effective_Date Termination_Date

Store Dimension (Type 1/2)	
PK	<u>Store_Key</u>
	Store_Code Store_Name ...

Coupon Dimension (Type 1)	
PK	<u>Coupon_Key</u>
	Coupon_Number Coupon_Amount ...

Periodic Snapshot Approach

- Typical Star Schema

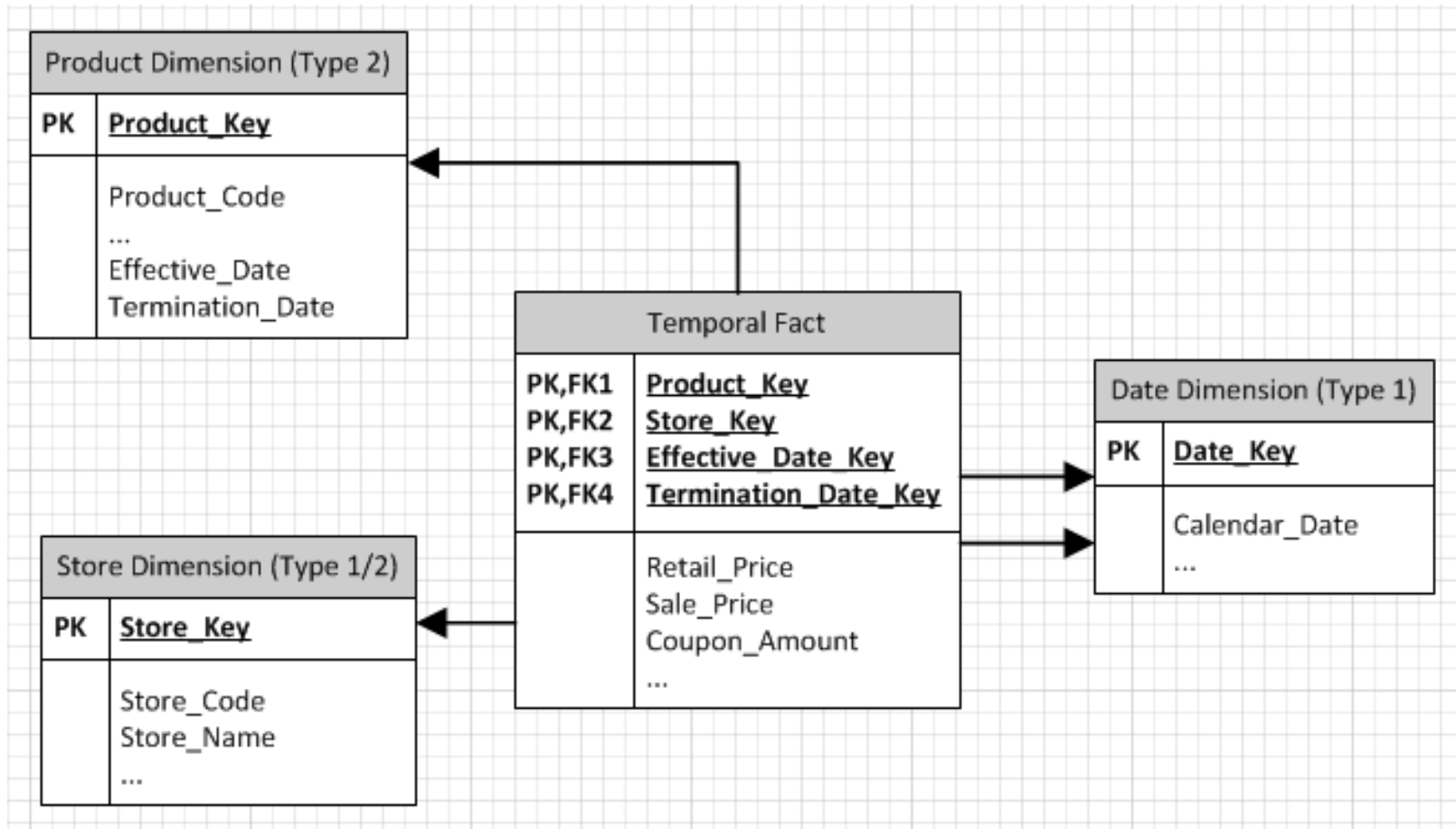


Periodic Snapshot Approach

- Pro's
 - More Like a Typical Star Schema
 - Flexible
- Con's
 - Daily Snapshots Required
 - Changes Too Volatile
 - 16M Records * 365 Days = **5.8B per Year**

What Next?

The Solution: Temporal Fact Table



Traditional vs. Temporal Facts

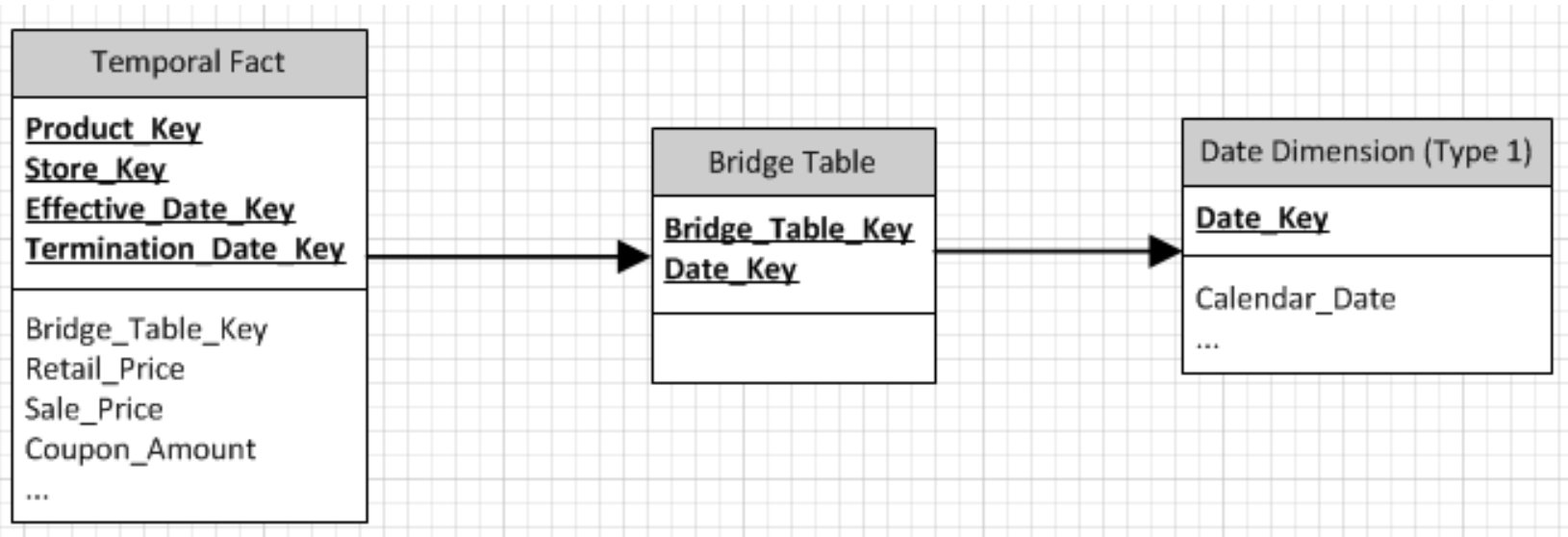
- Traditional Facts
 - Transactions
 - Specific Point in Time
 - No Updates
- Temporal Facts
 - Properties of “Dimension” with Factual Attributes
 - Volatile Changes
 - Snapshots Not an Option

Considerations

- Complex ETL Process
 - Parallel Processing
 - Use Stored Procedures
- Beware of Type-2 Dimension Changes
 - Sync with Temporal Fact Table
- Not a Replacement for Periodic Snapshots
 - Example: Stock-On-Hand

Considerations

- Cubes Will Require Additional Work



Will it Work?

Real World Example

- Pricing Tool Recommendations
 - 6k Line Store Procedure
 - 1.3M Recommendations in 47min
 - History of 1 Product < 1s

Additional Resources

- <http://temporaldata.com>
- Temporal Data LinkedIn Group
- Davide Mauri
 - Twitter: @mauridb
 - Blog: <http://www.davidemauri.it>

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