



# DBMS schemas for decision support

V. Vaishnavee

AP-AI-DS

SNSCE



# Introduction

- To solve modern business problems like market analysis, financial forecasting ->Multidimensional

How much revenue did the new product generate??



How much revenue did the new product generate by month, in the northeastern division, by sales office, compared with the plan??

**Multidimensional data  
model -> cube**

Many  
dimensions



# Basics of DM

- The basic concepts of dimensional modeling are:

facts, dimensions and measures

- A fact is a **collection of related data items**, consisting of measures and context data. It typically represents business items or business transactions.
- e.g., sales revenue by month by product. Facts are also known as measurements or metrics.
- A dimension is a **collection of data that describe one business dimension**.
- A measure is a **numeric attribute of a fact**, representing the performance or behavior of the business relative to the dimensions.



Considering Relational context, there are **three basic schemas** that are used in dimensional modeling

1. Star schema
2. Snowflake schema
3. Fact constellation schema



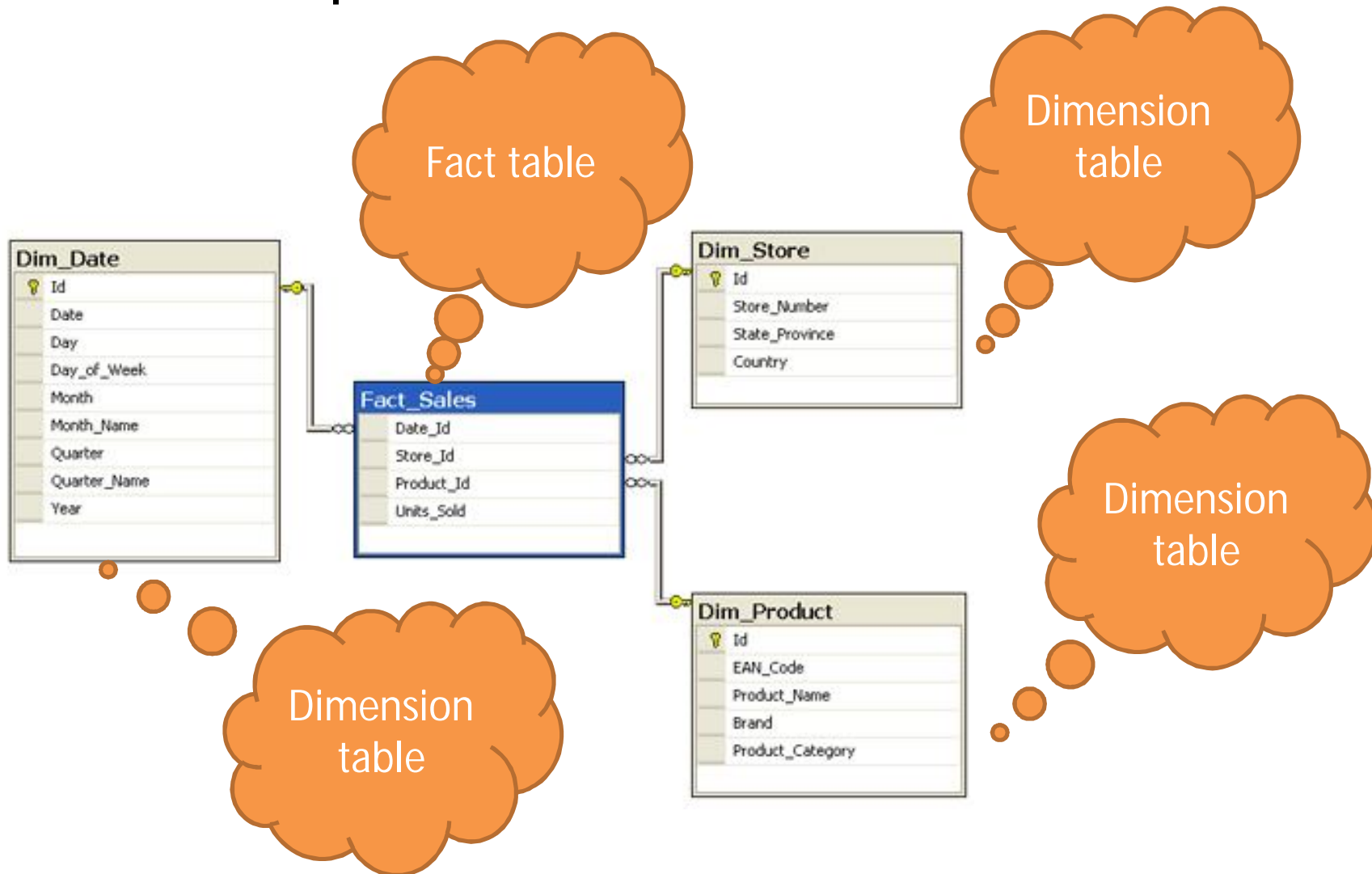


# Star schema

- The basic of star schema is that information can be classified into two groups:
  - Facts
  - Dimension
- Star schema has
  - one large central table (fact table)
  - set of smaller tables (dimensions)
  - arranged in a radial pattern around the central table.
- Facts are core data element being analyzed while dimensions are attributes about the facts.
- Which schema?
  - analysis of project requirements, accessible tools and project team preferences.



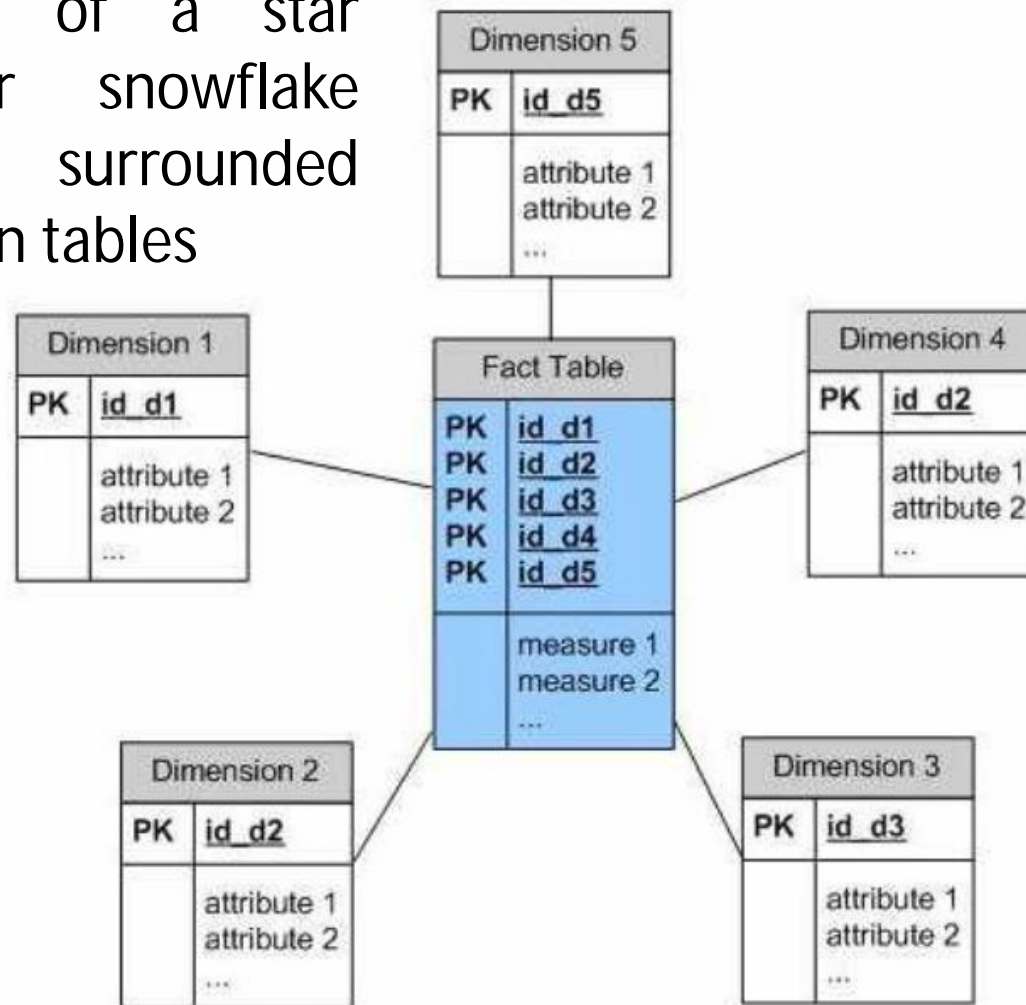
# Example of fact table – STAR SCHEMA





# Example of fact table – STAR SCHEMA

A fact table is found at the center of a star schema or snowflake schema surrounded by dimension tables





# STAR SCHEMA

- simplest data warehouse schema.
- Why named as star schema??
  - the diagram resembles a star, with points radiating from a center.
- The center of the star consists of fact table and the points of the star are the dimension tables.
- most commonly used nowadays and is recommended by **Oracle**.





# Fact Tables

- Contains **summarized numerical and historical data** (facts) and a multipart index composed of **foreign keys** from the primary keys of related dimension tables.
- A fact table typically has two types of columns:
  - **foreign keys** to dimension tables and
  - **measures** those that contain numeric facts.



# Dimension Tables

- Dimensions are categories by which summarized data can be viewed.
- E.g.
- a profit summary in a fact table can be viewed
  - by a Time dimension (profit by month, quarter, year),
  - Region dimension (profit by country, state, city),
  - Product dimension (profit for product1, product2).
- A dimension is a structure usually composed of one or more hierarchies that categorizes data.
- If a dimension hasn't got a hierarchies and levels it is called **flat dimension or list**.
- The primary keys of each of the dimension tables are part of the composite primary key (set of more than one **key** that, together, uniquely identifies each record) of the fact table.
- Example:
- Fact tables store data about sales while dimension tables data about geographic region (markets, cities), clients, products, times, channels.



# Measures

- Measures are numeric data based on columns in a fact table.
- They are the primary data which end users are interested in. E.g. a sales fact table may contain a profit measure which represents profit on each sale.



# Snowflake schema and Fact constellation schema

- **Snowflake schema:**
  - decomposing one or more of the dimensions.
  - The decomposed snowflake structure visualizes the **hierarchical structure** of dimensions very well.
- **Fact constellation schema:**
  - splitting the original star schema into more star schemes each of them describes facts on another level of dimension hierarchies)
  - Multiple fact tables share dimension tables.