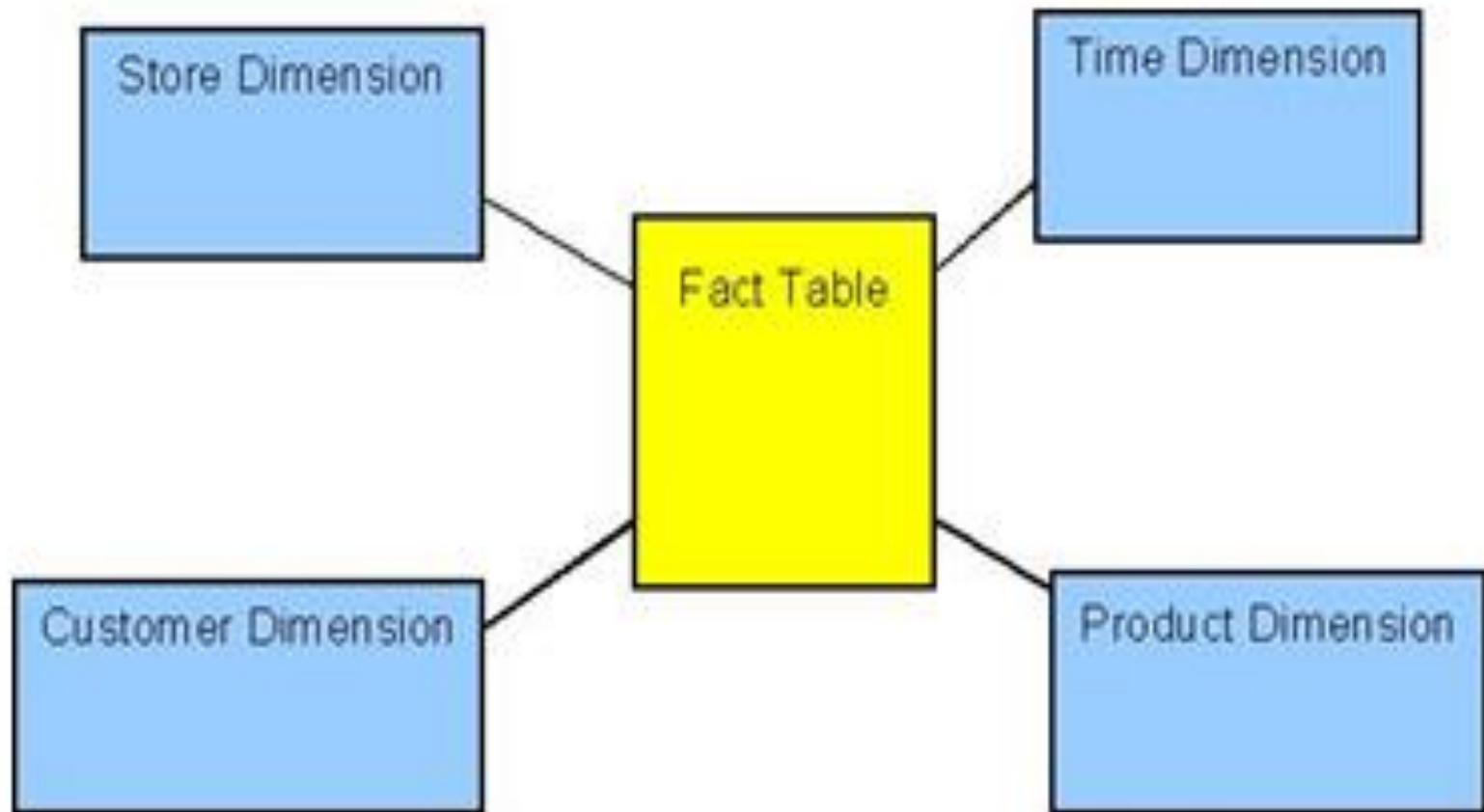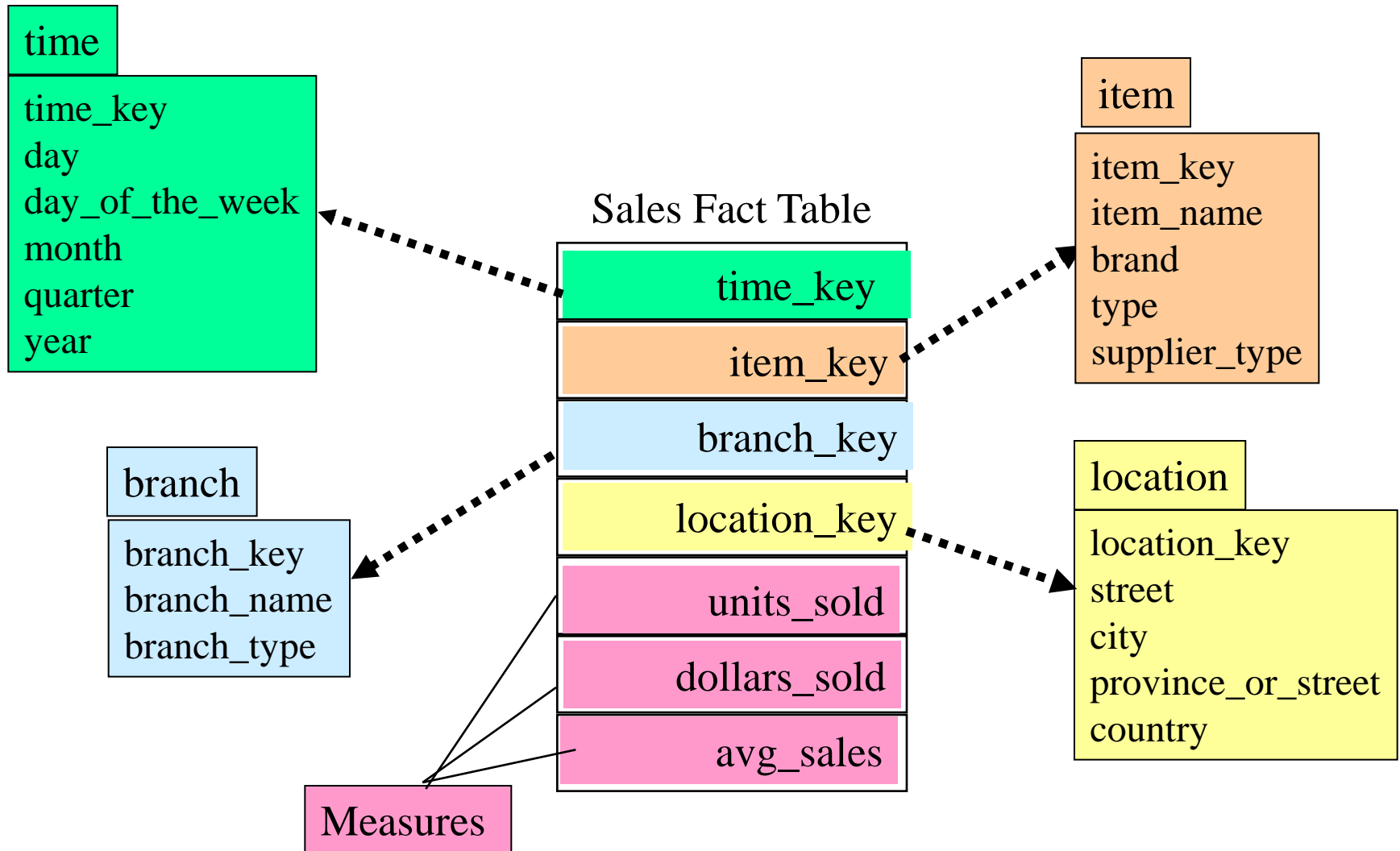# Star & Snowflake Schemas

What is Star Schema?

- In the star schema design, **a single object (the fact table) sits in the middle and is radially connected to other surrounding objects (dimension lookup tables) like a star.**

- **Each dimension** is represented as **a single table.**

- The primary key in each dimension table is related to a foreign key in the fact table.

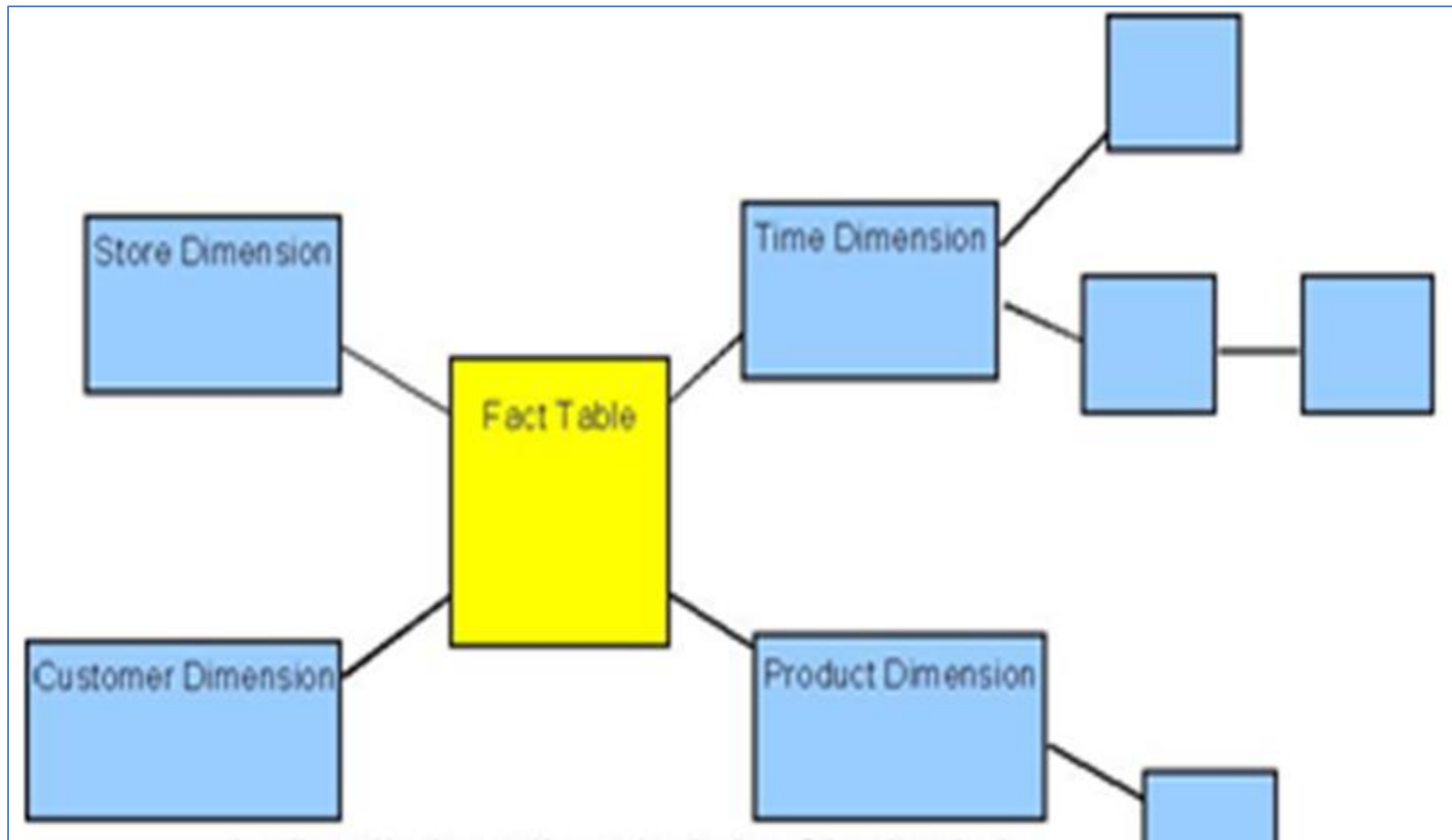# Example of Star Schema (Conceptual Model)

Example of Star Schema (Logical Model)

Sales Fact Table

time
- time_key
- day
- day_of_the_week
- month
- quarter
- year

item
- item_key
- item_name
- brand
- type
- supplier_type

branch
- branch_key
- branch_name
- branch_type

location
- location_key
- street
- city
- province_or_street
- country

Sales Fact Table:
- time_key
- item_key
- branch_key
- location_key
- units_sold
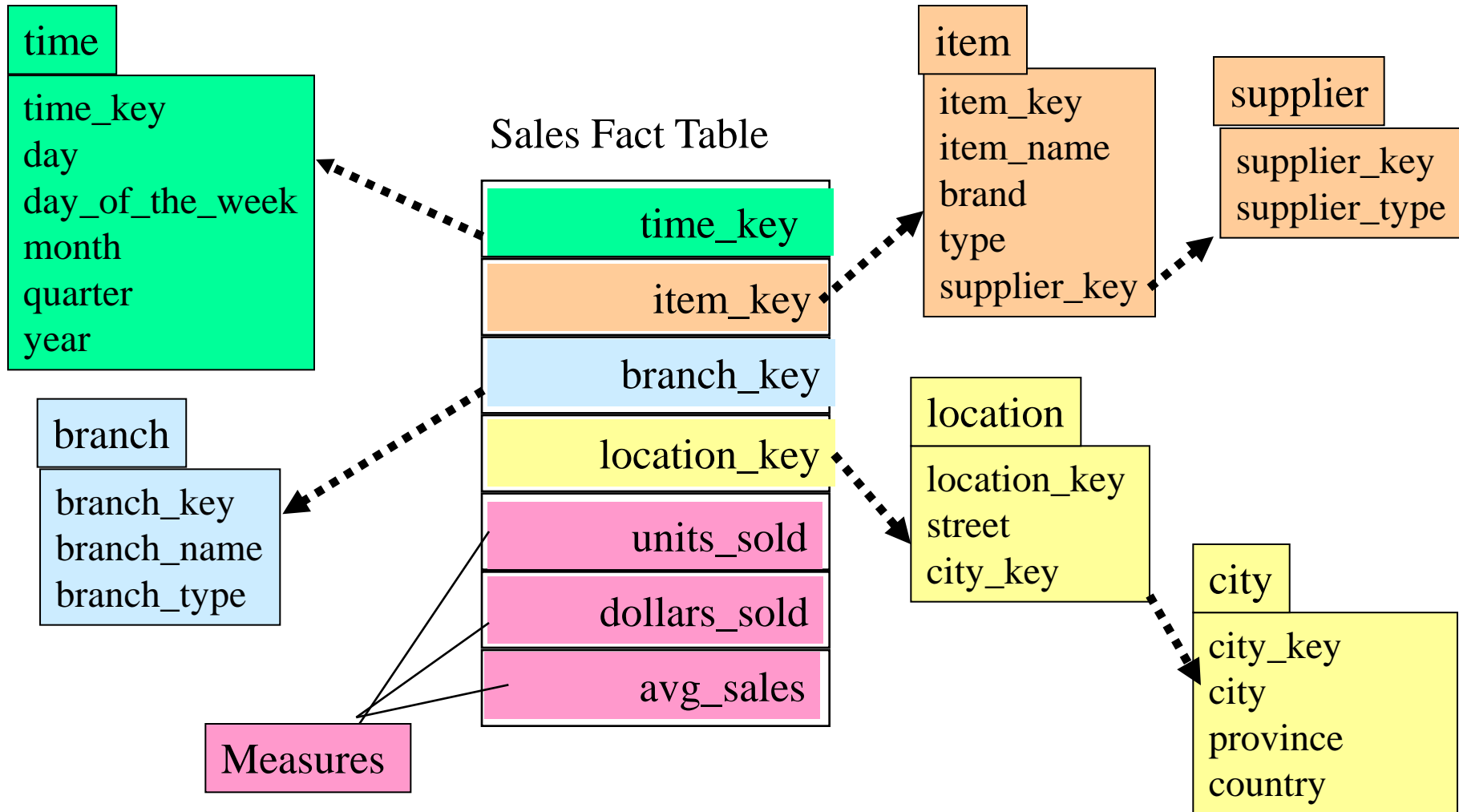- dollars_sold
- avg_sales

Measures

What is Snowflake Schema?

- The snowflake schema is an <u>extension</u> of the star schema, **where each point of the star explodes into more points.**

- In a star schema, each dimension is represented by a single dimensional table, **whereas in a snowflake schema, that dimensional table is normalized into multiple lookup tables, each representing a level in the dimensional hierarchy.**

Example of Snowflake Schema (Conceptual Model)

Example of Snowflake Schema (Logical Model)

Star Schema Vs Snowflake Schema

1ˢᵗ point

- Star schema consists of single fact table surrounded by some dimensional table.

- In snowflake schema the dimension tables are connected with some sub dimension tables.

2ⁿᵈ point

- Star Schema is De-Normalized.
- Snowflake Schema is Normalized.

3ʳᵈ point

- In Star Schema there is no need of using JOINS to retrieve data within Dimension tables.

- In Snowflake Schema JOINS are inevitable within Dimension tables.

4th point

- In Star Schema the query processing time will be less resulting in less performance overhead.

- In Snowflake Schema the query processing time will be more due to JOINS resulting in more performance overhead.

5th point

- In a Star Schema a dimension table will not have any parent table.

- In a Snowflake schema a dimension table will have one or more parent tables.

6th point

- Hierarchies for the dimensions are stored in the dimensional table itself in Star Schema.

- Hierarchies are broken into separate tables in snow flake schema. These hierarchies helps to drill down the data from topmost hierarchies to the lowermost hierarchies.

7th point

- Star Schema is used for **report** generation.
- Snowflake Schema is used for **cube**.

Summary

- Star and snowflake schema designs are mechanisms to separate facts and dimensions into separate tables.

- Snowflake schemas further separate the different levels of a hierarchy into separate tables.

- In either schema design, each table is related to another table with _a primary key/foreign key relationship_.

- Primary key/foreign key relationships are used in relational databases to define many-to-one relationships between tables.