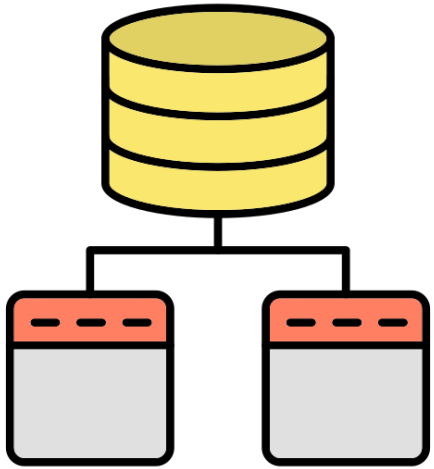
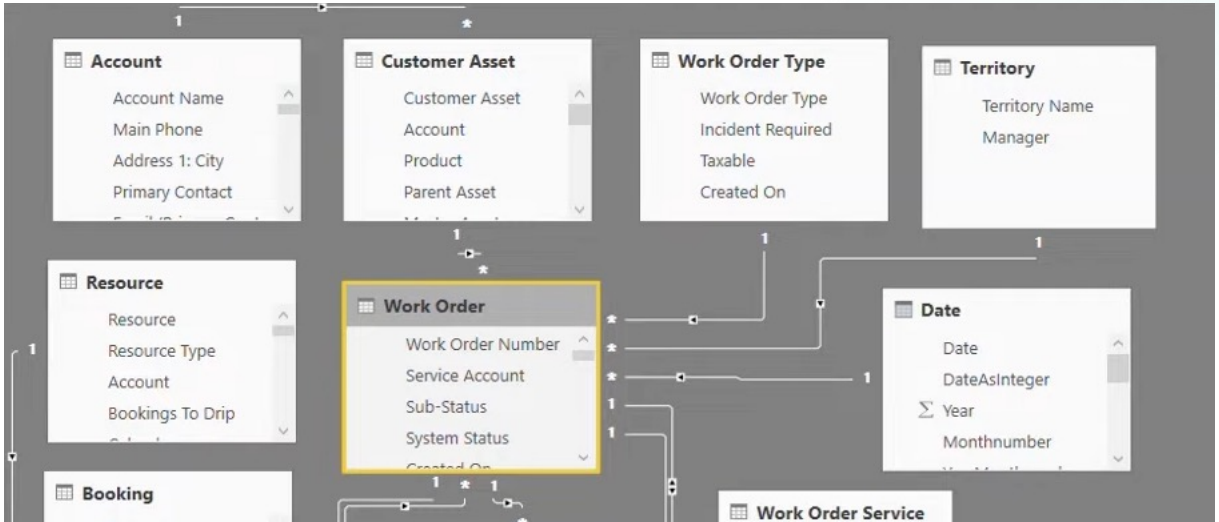
Data Modeling



Data Modeling

Data modeling is the process of creating a visual representation of the data structures, **relationships**, and **rules** within an organization's database. It involves organizing and structuring data to facilitate efficient analysis and reporting.



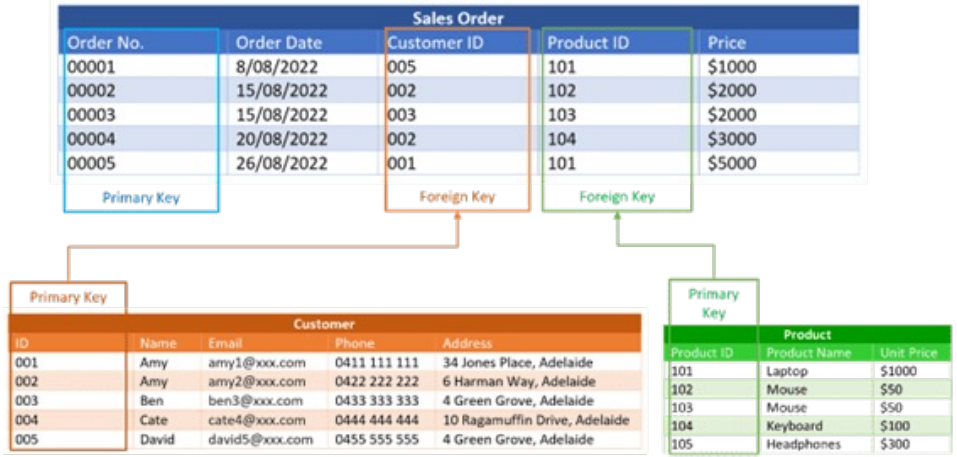
Why do we need Data Modeling

- To create meaningful relationship between tables
- To optimize data for analysis
- To create efficient and accurate reports
- To improve data quality

Primary Key vs Foreign Key

Primary keys are unique identifiers within a table, ensuring data integrity and uniqueness within the table itself.

Foreign keys establish relationships between tables, enabling the retrieval of related data from multiple tables based on the defined relationships.

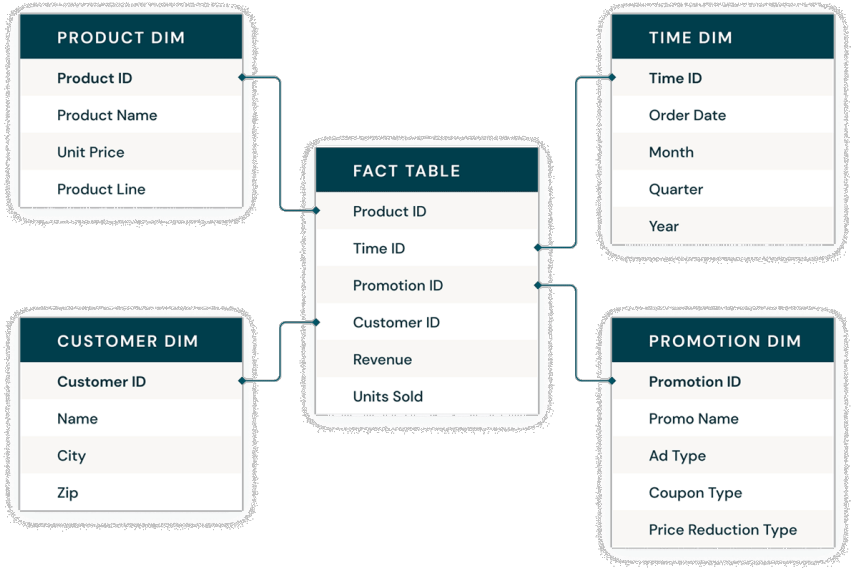


Proper utilization of primary and foreign keys ensures the integrity of data relationships and enables comprehensive data analysis and reporting within Power BI

Fact table vs Dimension table

Fact tables contain transactional data and quantitative information, representing business activities such as sales, orders, or transactions. They typically store numerical data that can be aggregated for analysis.

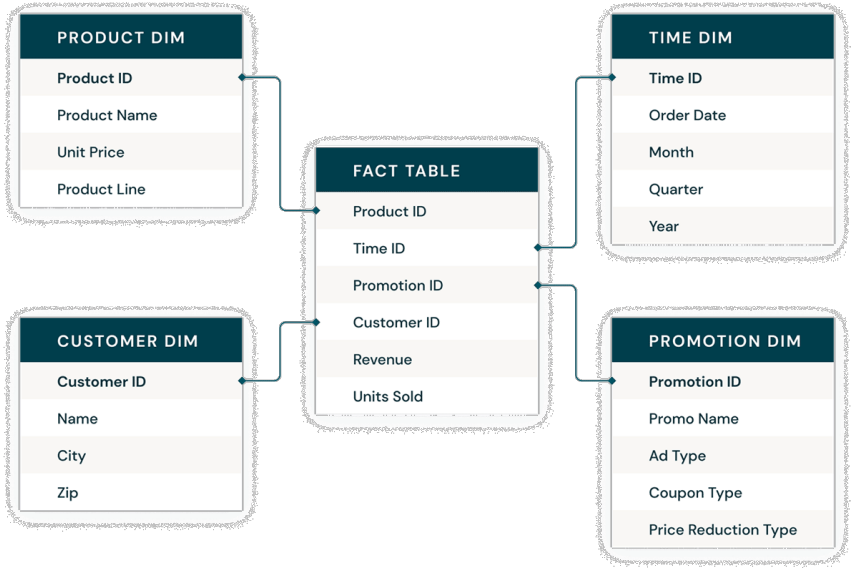
Role in Power BI Data Modeling: Fact tables serve as the **central repository** for capturing and storing **business metrics and transactional data**, providing the foundation for analytical reporting and data analysis.



Fact table vs Dimension table

Dimension tables contain descriptive attributes and metadata that provide context to the data in the fact tables. They store textual and categorical data that provide additional details about the business entities being analyzed.

Role in Power BI Data Modeling: Dimension tables **complement fact tables** by providing context and descriptive information, allowing users to **slice, filter, and drill down** into the data for deeper insights and analysis.



What is Relationship/Cardinality?

Relationships in Power BI establish connections between tables based on common fields, enabling the integration and analysis of related data from multiple tables.

One-to-Many (1:N) Relationship

Example: Sales Orders and Customers

Explanation: In this relationship, one customer can place multiple sales orders. The "CustomerID" in the Customers table serves as the primary key, while the "CustomerID" in the Sales Orders table acts as the foreign key, linking the two tables.

What is Relationship?

Relationships in Power BI establish connections between tables based on common fields, enabling the integration and analysis of related data from multiple tables.

Many-to-Many (N:N) Relationship

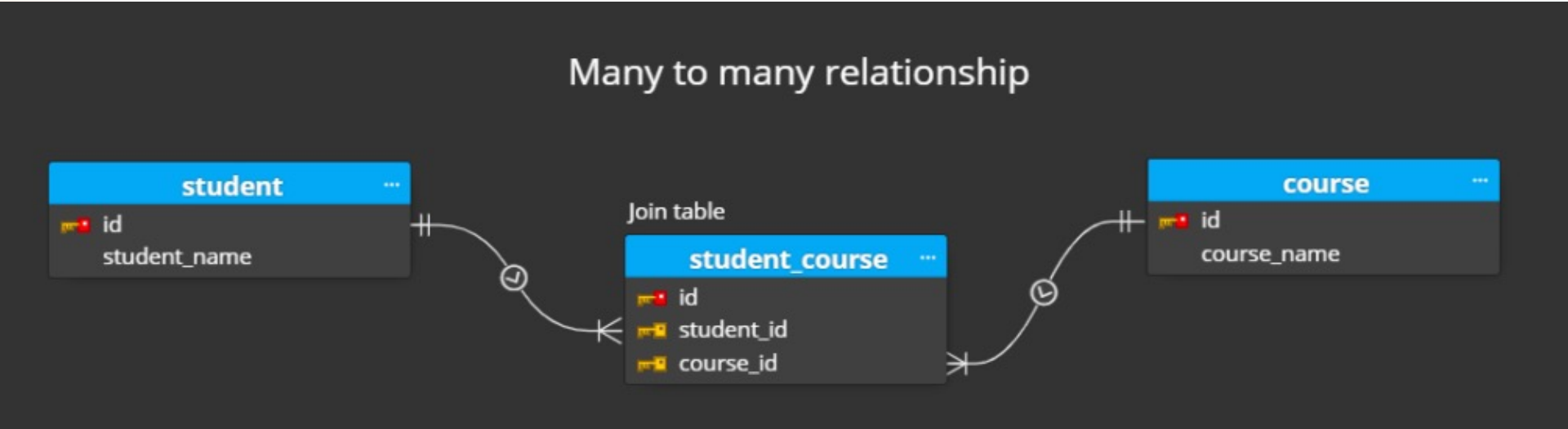
Example: Students and Courses

Explanation: A student can enroll in multiple courses, and a course can have multiple students. **A bridge table** is used to establish the relationship, linking the Students table and the Courses table through their respective primary keys.

What is Relationship?

Many-to-Many (N:N) Relationship

A bridge table is used to establish the relationship. A many-to-many relationship in Power BI occurs when multiple records in one table are related to multiple records in another table through an intermediary table.



Star Schema

A star schema is a type of data modeling schema that organizes data into a central "fact" table and multiple "dimension" tables, resembling the shape of a star.

The star schema is widely used in data warehousing and business intelligence for its simplicity, ease of querying, and optimized performance.