

# STAR SCHEMA DOCUMENTATION FOR ATLIQ MART SUPPLY CHAIN ANALYSIS

## INTRODUCTION

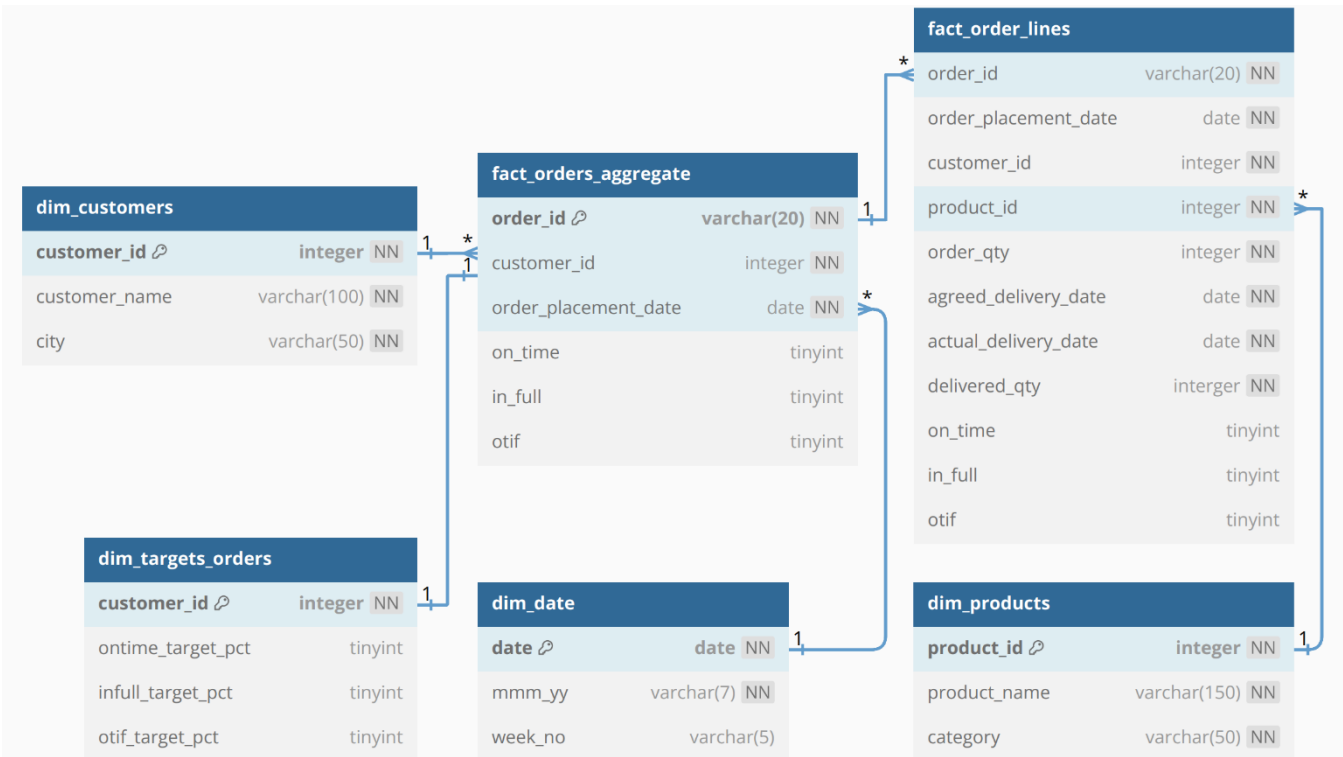
This document provides an overview of the star schema used for analyzing AtliQ Mart's supply chain data. The star schema organizes the data in a way that simplifies analysis and reporting by structuring it into fact and dimension tables. This schema supports comprehensive insights into delivery performance, customer satisfaction, and operational efficiency by focusing on key metrics like on-time and in-full deliveries.

## PURPOSE OF THE STAR SCHEMA

The purpose of this star schema is to:

- Facilitate the analysis of AtliQ Mart's delivery performance over time and across different customer segments.
- Enable quick and efficient reporting for business intelligence purposes, especially for measuring service levels and tracking operational issues.
- Provide a structured foundation for identifying and addressing bottlenecks, delays, and product-specific issues in the supply chain.

## COMPONENTS OF THE STAR SCHEMA



## FACT TABLES:

### 1. fact\_orders\_aggregate

This table summarizes key delivery metrics for each order, such as on-time and in-full delivery statuses.

- **Attributes:**
  - **order\_id**: Unique identifier for each order (**Primary Key**).
  - **customer\_id**: Link to the customer who placed the order (**Foreign Key**).
  - **order\_placement\_date**: Date when the order was placed

- **otif**: On-Time In-Full indicator.
- **on\_time**: Indicator for whether the order was delivered on time.
- **in\_full**: Indicator for whether the order was delivered in full.

## 2. fact\_order\_lines

This table provides line-item detail for each order, including ordered and delivered quantities, and the actual vs. agreed delivery dates,...

- **Attributes:**
  - **order\_id**: Unique identifier for each order (**Primary Key**).
  - **order\_placement\_date**: Date when the order was placed
  - **customer\_id**: Link to the customer who placed the order (**Foreign Key**).
  - **product\_id**: Link to the product ordered (**Foreign Key**).
  - **order\_qty**: Total quantity of products ordered.
  - **agreed\_delivery\_date**: Date agreed upon for delivery
  - **actual\_delivery\_date**: Date when the order was actually delivered
  - **delivered\_qty**: Quantity of the product delivered
  - **otif**: On-Time In-Full indicator.
  - **on\_time**: Indicator for whether the order was delivered on time.
  - **in\_full**: Indicator for whether the order was delivered in full.

## DIMENSION TABLES:

### 1. dim\_customers

This table contains demographic information about customers, helping analyze performance based on customer profiles.

- **Attributes:**
  - **customer\_id**: Unique identifier for the customer (**Primary Key**).
  - **customer\_name**: Name of the customer.
  - **city**: Customer's location (city).

### 2. dim\_targets\_orders

This table captures delivery performance targets for each customer, which will be compared against the actual delivery performance.

- **Attributes:**
  - **customer\_id**: Unique identifier for each customer (**Primary Key**).
  - **otif\_target\_pct**: On-Time In-Full target percentage.
  - **infull\_target\_pct**: In-Full target percentage.
  - **on\_time\_target\_pct**: On-Time target percentage.

### 3. dim\_products

This table contains details about the products AtliQ Mart offers, including categories to support analysis of performance by product.

- **Attributes:**
  - **product\_id:** Unique identifier for each product (**Primary Key**).
  - **product\_name:** Name of the product.
  - **category:** Product category.

### 4. dim\_date

This table provides temporal information, enabling time-based analysis of delivery performance across different periods.

- **Attributes:**
  - **date:** Specific date.
  - **month:** Month and year in text format.
  - **week\_no:** Week number of the year in text format.

## RELATIONSHIPS IN THE STAR SCHEMA

The star schema is designed to be simple and easy to query, with the fact table at the center surrounded by dimension tables. Below are the key relationships in the schema:

1. **Tables: dim\_customers and fact\_orders\_aggregate**
  - **Relationship Type:** One-to-Many
  - **Description:** Each record in the fact\_orders\_aggregate table corresponds to a customer in the dim\_customers table via customer\_id.
2. **Tables: dim\_products and fact\_order\_lines**
  - **Relationship Type:** One-to-Many
  - **Description:** Each order in the fact\_order\_lines table refers to a product in the dim\_products table through product\_id.
3. **Tables: dim\_date and fact\_orders\_aggregate**
  - **Relationship Type:** One-to-Many
  - **Description:** Each order in the fact\_orders\_aggregate table corresponds to a specific date in the dim\_date table, where the order\_placement\_date column in fact\_orders\_aggregate matches the date column in dim\_date.
4. **Tables: dim\_targets\_orders and fact\_orders\_aggregate**
  - **Relationship Type:** One-to-Many
  - **Description:** Each record in the fact\_orders\_aggregate table is linked to a corresponding performance target for the customer in the dim\_targets\_orders table via customer\_id. This relationship helps measure how well the actual performance meets customer targets.
5. **Tables: fact\_orders\_aggregate and fact\_order\_lines**
  - **Relationship Type:** One-to-Many

- **Description:** Each order in **fact\_orders\_aggregate** can have multiple line items in the **fact\_order\_lines** table via **order\_id**, representing individual products ordered. This relationship supports detailed analysis at the product level within each order, helping identify specific items that may frequently encounter delivery issues.

### **Benefits of the Star Schema for AtliQ Mart**

1. **Simplicity and Efficiency:**

The star schema's simple structure with a central fact table and surrounding dimension tables makes it easier to design and understand. It also supports efficient querying, which is important for real-time analytics and reporting.

2. **Performance Tracking:**

The schema enables AtliQ Mart to track delivery performance across various dimensions such as time, product, and customer. This allows for detailed analysis of where improvements are needed.

### **Conclusion**

The star schema enables AtliQ Mart to analyze delivery performance data in a structured, flexible manner. By separating facts and dimensions, the schema supports easy aggregation and drill-down analysis, enabling the company to make data-driven decisions that improve supply chain operations, customer satisfaction, and business performance.