

Northwind Traders Data Warehouse Solution

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Company Profile

Northwind Traders is an international import and export company specializing in food products such as beverages, dairy items, condiments, grains, and specialty goods.

NORTHWIND TRADERS



INTERNATIONAL IMPORT & EXPORT COMP.
SPECIALTY FOODS

Problem

1

Limited Sales Visibility

- Hard to track sales by region, product, or customer.

2

Unclear Profitability

- Discounts and supplier costs affect profit margins, but there's no clear analysis.

3

Logistics Monitoring

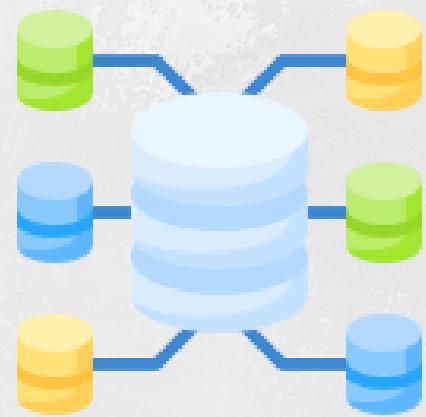
- Shipping delays and costs are not well understood, making it hard to evaluate shipping partners.

4

Fragmented Reporting



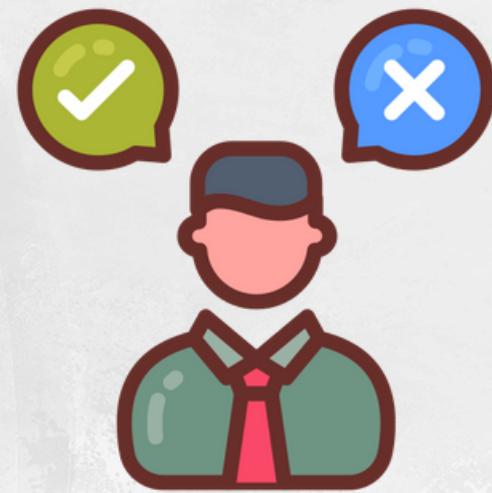
Solution



Provide a single version
of truth for sales &
operations



Enable accurate, timely
reporting



Support decision-making
with insights on performance

Business Requirements

- Sales Insights
- Profitability Analysis
- Customer & Employee Performance
- Logistics & Delivery



Business Process

- Sales
- Shipments
- Invoices



— Modeling

We offer flexible, scalable services for businesses of all sizes.

Dimentions

- employee
- customers
- supplier
- product
- shipper
- Invoice
- Date

Fact Table

- Sales
- Shipment
- Invoice

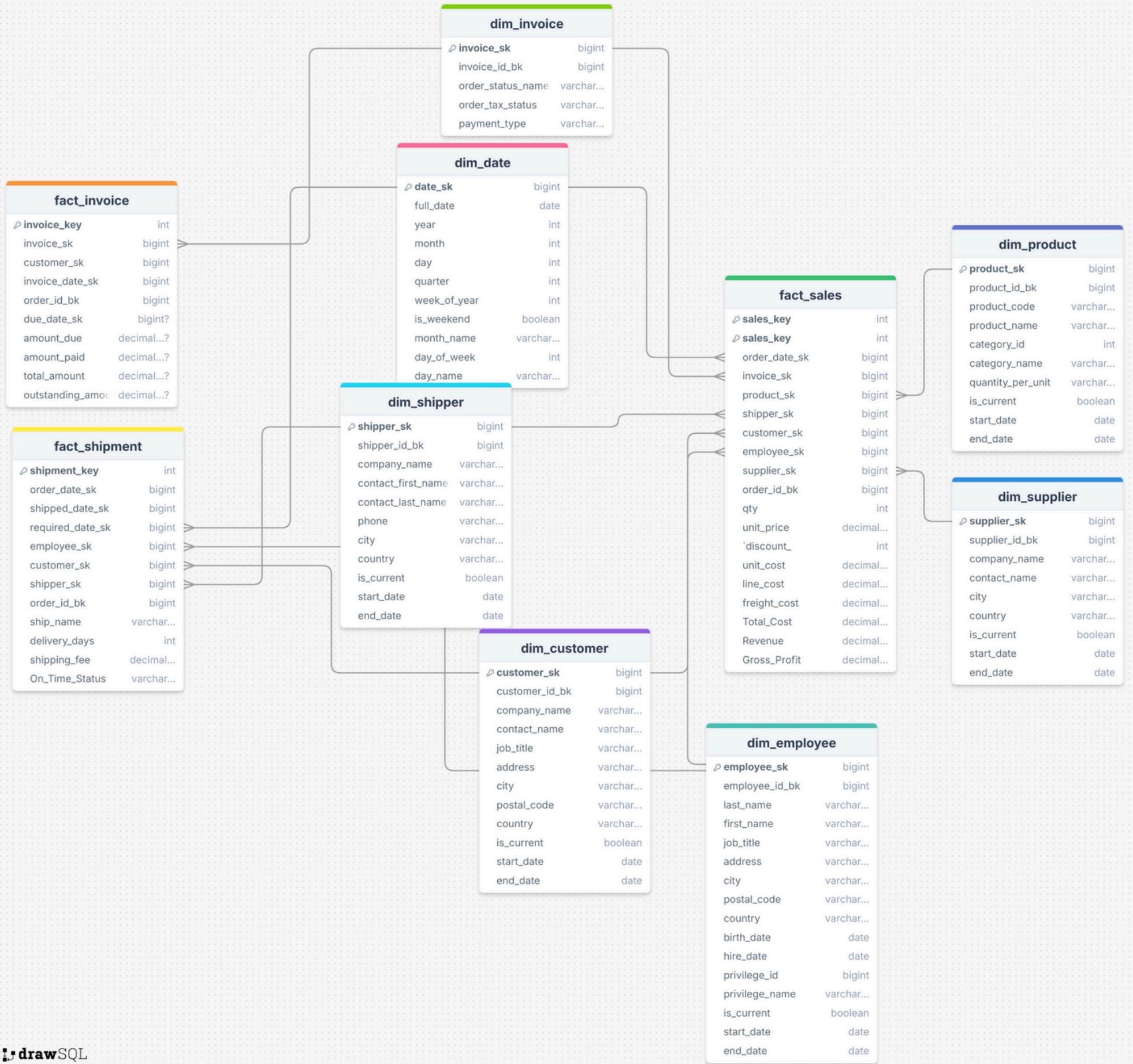


Measures

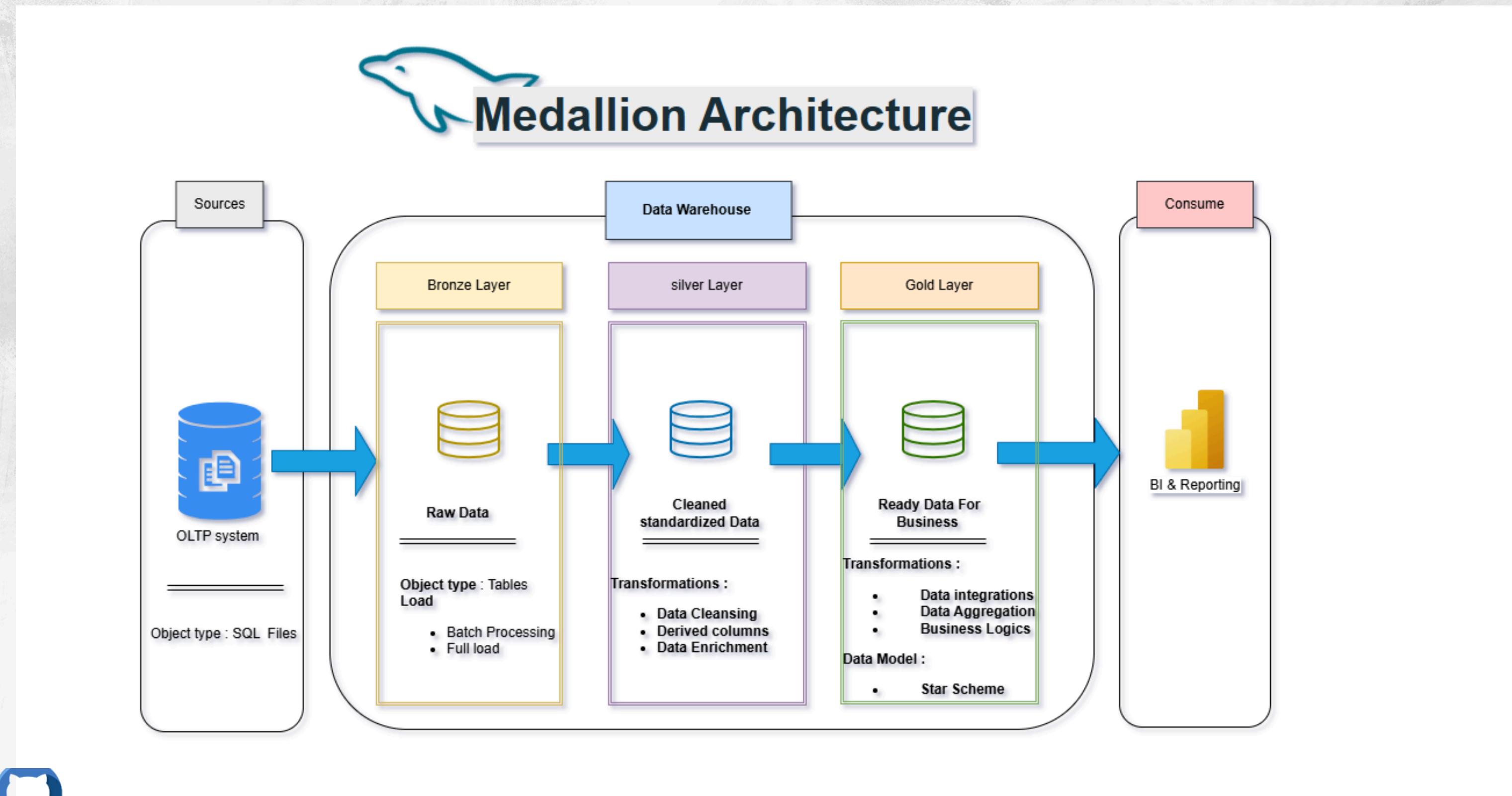
- Sales 💵 → Total sales revenue = (Quantity × Unit Price) × (1 - Discount)
- Discount % 🎉 → Percentage of discount applied on an order line
- Quantity 📦 → Number of units sold per product/order line
- Ship Cost 🚚 → Actual cost of shipment (line cost or unit cost × qty)
- Ship Fee 📜 → Shipping fee charged to the customer
- Profit Margin 📈 → $(\text{Revenue} - \text{Total Cost}) \div \text{Revenue}$
- Gross Profit 💰 → Revenue - Total Cost
- Total Cost \$ → Line Cost + Freight Cost
- Delivery Days 🕒 → Difference between Shipped Date and Order Date
- On-Time Status ✅❌ → Categorization: On Time, Late, or Unknown
- Invoice Amount Due 📋 → Expected payment from customer
- Invoice Amount Paid 💳 → Amount already paid
- Outstanding Amount 💸 → Total Amount - Amount Paid



Data Modeling (Schema Design)



Medallion Architecture – ETL Pipeline



Questions the DWH Can Answer

Sales Insights

- What are total sales by product, category, region, customer, or sales representative?
- Who are the top 10 customers and top 10 products driving revenue?
- How do sales trends change month to month and quarter to quarter?

Profitability Analysis

- Which product categories and suppliers have the highest or lowest profit margins?
- How much do discounts reduce revenue and profitability?

Customer & Employee Performance

- Which regions/customers buy the most?
- Which employees generate the most revenue or handle the most orders?

Logistics & Delivery

- What is the average delivery time from order to shipment?
- Which shipping partners are fastest and most cost-effective?



SQL Queries

```
-- Total Sales by Product
```

```
SELECT  
    dp.product_name,  
    SUM(fs.Revenue) AS total_revenue  
FROM fact_sales fs  
JOIN dim_product dp ON fs.product_sk = dp.product_sk  
GROUP BY dp.product_name  
ORDER BY total_revenue DESC;
```

```
Discount Impact
```

```
SELECT  
    SUM(fs.unit_price * fs.qty) AS revenue_before_discount,  
    SUM(fs.Revenue) AS revenue_after_discount,  
    (SUM(fs.unit_price * fs.qty) - SUM(fs.Revenue)) AS discount_impact  
FROM fact_sales fs;
```

```
-- Sales by Region
```

```
SELECT  
    dc.country,  
    SUM(fs.Revenue) AS total_revenue  
FROM fact_sales fs  
JOIN dim_customer dc ON fs.customer_sk = dc.customer_sk  
GROUP BY dc.country  
ORDER BY total_revenue DESC;
```

```
-- Top Employees by Sales
```

```
SELECT  
    de.first_name, de.last_name,  
    SUM(fs.Revenue) AS total_revenue  
FROM fact_sales fs  
JOIN dim_employee de ON fs.employee_sk = de.employee_sk  
GROUP BY de.first_name, de.last_name  
ORDER BY total_revenue DESC;
```

```
- Top 10 Customers by Revenue
```

```
SELECT  
    dc.company_name,  
    SUM(fs.Revenue) AS total_revenue  
FROM fact_sales fs  
JOIN dim_customer dc ON fs.customer_sk = dc.customer_sk  
GROUP BY dc.company_name  
ORDER BY total_revenue DESC  
LIMIT 10;
```

```
-- Profit Margin by Category
```

```
SELECT  
    dp.category_name,  
    SUM(fs.Gross_Profit) / SUM(fs.Revenue) AS profit_margin  
FROM fact_sales fs  
JOIN dim_product dp ON fs.product_sk = dp.product_sk  
GROUP BY dp.category_name  
ORDER BY profit_margin DESC;
```

```
-- Sales Trends by Month
```

```
SELECT  
    d.year,  
    d.month,  
    SUM(fs.Revenue) AS total_revenue  
FROM fact_sales fs  
JOIN dim_date d ON fs.order_date_sk = d.date_sk  
GROUP BY d.year, d.month  
ORDER BY d.year, d.month;
```

```
-- Average Delivery Time
```

```
SELECT  
    AVG(fs.delivery_days) AS avg_delivery_days  
FROM fact_shipment fs;
```



The End

THANK YOU FOR LISTENING

