**NORTHWIND TRADERS – SALES ANALYTICS**

**Project Overview**

This project focuses on developing a comprehensive and interactive business intelligence dashboard for Northwind Traders, dealing the import and export of specialty food products. The dashboard aims to consolidate various aspects of the company's operations—customer behaviour, employee performance, inventory movement, supplier engagement, and order transactions—into meaningful visual insights that support informed strategic decision-making.

**Objective**

* To analyze and visualize key performance indicators (KPIs) across customers, orders, employees, products, suppliers, and shippers.
* To build an intuitive and user-friendly Power BI report that simplifies complex datasets for easy interpretation by business users.
* To provide actionable insights through dynamic filters and interactivity for deeper data exploration.
* To improve decision-making by uncovering trends, gaps, and opportunities using historical sales and operations data.

**Significance of the Project**

* **Enhanced Decision-Making**: Equips stakeholders with data-driven insights into sales performance, employee productivity, and customer segmentation.
* **Centralized Dashboard**: Integrates multiple datasets into a single unified reporting interface.
* **Operational Efficiency**: Identifies inefficiencies and bottlenecks in order processing, inventory management, and supplier reliability.
* **Strategic Planning**: Facilitates long-term planning with data-backed analysis on demand trends, best-performing products, and employee output.

**Data Dictionary (Northwind Dataset)**

Below is a simplified dictionary of the core tables typically used in the Northwind dataset:

|  |  |
| --- | --- |
| **Table Name** | **Description** |
| **Customers** | Stores information about customers including contact name, address, country, and customer ID. |
| **Orders** | Contains individual sales orders including Order ID, Customer ID, Employee ID, Order Date, and Ship Via. |
| **Order Details** | Line-level data for each order including Product ID, Quantity, Unit Price, and Discount. |
| **Employees** | Contains employee information such as name, title, region, and who they report to. |
| **Products** | Information about products including Product ID, Name, Supplier ID, Category ID, Unit Price, and Units In Stock. |
| **Suppliers** | Stores supplier information including Supplier ID, Company Name, Contact Info, and Address. |
| **Shippers** | Contains shipping company data including Shipper ID and Company Name. |
| **Categories** | Defines product categories like Beverages, Condiments, etc. |

**ER DIAGRAM**

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**STEPS TO CONNECT TO DATA**

1. **In Power BI, go to Home → Get Data → Text/CSV → Selected file**
2. In the preview window, click **Transform Data** instead of Combine.
3. In the Queries Pane in the Power Query tab, **right click** **→ New Query → Select next CSV file**
4. **Repeat this for all files**
5. Click **Close & Apply** to load this as a separate table.

**DETAILED EXPLANATIONS AND INSIGHTS**

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**Geographic Insights**

* **Top Countries by Customer Count:**
  + **USA leads with 13 customers, followed by France (11) and Germany (11).**
  + **These three countries together contribute nearly 39% of total customers (35 out of 91).**
* **Continent-wise Customer Distribution:**
  + **Europe dominates with 54 customers (59.34%).**
  + **North America follows with 21 customers (23.08%).**
  + **South America has 16 customers (17.58%).**
* **City-Level Presence:**
  + **The brand is present in 69 cities.**
  + **France alone has customers in at least 10+ cities, showing strong city-level penetration in Europe.**
* **Market Reach:**
  + **The brand is operating in 21 countries — a good sign of global spread.**

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**Customer Profile Insights**

* **Top Contact Titles**:
  + **Owner** and **Sales Representative** both lead with **17 customers** each.
  + Followed by **Marketing Manager (12)** and **Sales Manager (11)**.
  + Majority of contacts are **decision-makers or sales roles**





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* **Rising Trend Over Years:**
* From **1994 to 1996**, both the **number of orders** and **order volume** have **increased** significantly.
* **Total orders** in 1994 were much lower compared to 1995 and 1996, indicating **growing customer activity**.
* **Peak Period:**
* **May 1996** had the **highest order volume** (4,957 units from 77 orders).
* Followed by **April 1996** and **March 1996**, confirming a strong **Q2-1996** performance.
* **1996 Q2 Surge:**
* This quarter alone (April–June 1996) had:
  + **161 orders**
  + **11,697 units** in volume
* That's **~23% of total order volume** in just one quarter — suggesting a **seasonal or promotional effect**.
* **Volume per Order Insight:**
* Average order volume per order = Order Volume / Number of Orders
* In high-performing months like May 1996:  
  4957 / 77 ≈ 64 units per order
* Some months had a higher **order size** even with fewer orders (e.g., **Dec 1995**: 35 orders but 1878 units).

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* **Heavy concentration in lower bins**:
* **234 orders** fall in the **0–500** range.
* **~200 orders** in the **501–1000** range.
* A significant drop-off after that: only **55 orders** in **2000–2500** and **12 in 4000–4500.**
* **Long tail of high-value orders**:
* Sparse distribution after the **7000** mark.
* Just a few orders fall in high-value bins like **10K–10.5K**, **15K**, etc.
* These could represent **bulk or wholesale customers** or **special orders**.

~54% Order Value contributed by bins in the range **1500-2000, 500-1000, 1000-1500, 2500-3000 and 2000-2500.**



* **Insights**
  + - * + **Federal Shipping** delivers the fastest on average.
        + **United Package** has the **longest average shipping time**.
        + The gap between fastest and slowest is **~1.76 days**, which could be significant for time-sensitive deliveries.
* **Recommendations**
  + Consider **prioritizing Federal Shipping** for urgent orders or high-value customers.
* **Sales Representatives** dominate the employee distribution, making up **75%** of the sales team (6 out of 8).
* There's a **flat structure** beyond the Sales Representatives, with only one person in each higher role.
* This distribution suggests the team is **execution-heavy** (operational), with limited strategic or managerial roles.

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* **Even distribution: All bins (31–33 years of tenure) have exactly 3 employees.**
* **Mature and experienced workforce**

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* **Manager ID 2 has 5 direct reports.**
* **Manager ID 5 has 3 direct reports.**
* **(Blank) means the top-level person (VP, Sales) who does not report to anyone.**

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(1,577 units).

* Company has 77 distinct products and all those products

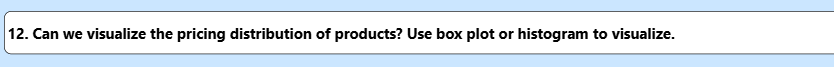
have registered sales over time.



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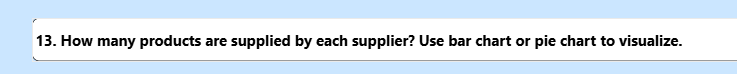
* **Beverages** are the top-selling category, followed closely by **Dairy Products**.
* Together, **Beverages + Dairy + Confections + Seafood** contribute the bulk of the sales.
* **Produce** and **Meat/Poultry** have relatively lower volumes



* **Majority of products (70 out of 77)** are priced below **50**, indicating a **low to moderate pricing strategy** for most items.

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* **Top Suppliers (5 products each):**
  + **Pavlova, Ltd.**
  + **Plutzer Lebensmittelgroßmärkte AG**
* **Second Tier (4 products each):**
  + **New Orleans Cajun Delights**
  + **Specialty Biscuits, Ltd.**



* Some suppliers rely heavily on a single premium product
* A screen shot of a graph

  AI-generated content may be incorrect.**Others have diversified portfolios** with multiple lower/mid-priced products (e.g., G'day, Mate, Tokyo Traders).

A map of europe with different colored circles

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* **Continent-wise Customer Distribution:**
  + **Europe dominates with 54 customers (59.34%).**
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**CONCLUSION**

**1. Sales Performance Overview**

* **The dashboard highlights overall revenue trends, seasonal patterns, and sales peaks, helping identify high-performing months and dips in sales.**
* **Granular filtering by region, product category, and time allows management to spot key drivers of revenue growth or decline.**

**2. Customer Distribution & Behavior**

* **Customer segmentation by location, buying frequency, and rating uncovers regional opportunities and underserved markets.**
* **High concentration of customers in specific geographies (as seen in the map visualization) suggests where to scale operations or tailor marketing campaigns.**

**3. Product Sales & Pricing Analysis**

* **Clear visibility into top-selling products, product profitability, and price distribution across suppliers.**
* **The product pricing chart shows stark pricing differences—helping identify products with the best price-to-value ratio and potential for price optimization or bundling strategies.**

**4. Employee & Staff Performance**

* **Employee-level metrics on sales contribution, customer ratings, and productivity reveal top performers and training needs.**
* **Staff working underperforming stores or product lines can be upskilled or reassigned strategically.**

1. **Supplier Network Evaluation**

* **A geographically concentrated supplier base mostly in Europe, with a few dominant suppliers in terms of pricing and volume.**
* **Opportunities exist to diversify suppliers, reduce reliance on high-cost vendors, and optimize the procurement strategy.**

**Strategic Value Delivered**

* **Real-time decision-making: Through slicers, filters, and dynamic charts.**
* **Business growth opportunities: Identified by drilling into high-performing products, stores, and customer segments.**
* **Cost optimization avenues: In procurement and logistics through supplier price analysis and order bin sizing.**