📊 Business Analytics Project Report

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Audience: CEO & CMO
Objective: Deliver a structured analysis of sales data to answer four executive questions, highlight expansion opportunities, and demonstrate rigorous data preparation and visualization methodology.

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1. Project Overview

This project was designed to transform raw transactional sales data into actionable insights for executive decision-making. The analysis focused on four key business questions posed by leadership, each addressing revenue, demand, and customer concentration. The deliverables include cleaned datasets, standardized measures, and executive-ready visualizations in Power BI.

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2. Data Engineering & Preparation

2.1 Data Ingestion

- Imported raw transactional data into **Power BI Desktop**.
- Established a **fact table (Sales_Clean)** containing:
    - InvoiceDate, CustomerID, Country, Quantity, UnitPrice, Product.

2.2 Data Cleaning

- **Date normalization:** Extracted Year, Month Num, and Month Name for chronological sorting.
- **CustomerID handling:** Replaced blanks with "Guest" to preserve revenue attribution.
- **Country harmonization:** Standardized naming conventions (e.g., “USA” → “United States”), removed duplicates.
- **Outlier management:** Flagged negative or zero values in Quantity and UnitPrice; retained only legitimate returns.
- **Type enforcement:** Cast numeric fields correctly; ensured categorical consistency for Country and CustomerID.

2.3 Measure Creation

- **Revenue (dynamic measure):**
- Revenue = SUMX(Sales_Clean, Sales_Clean[Quantity] * Sales_Clean[UnitPrice])
- **Total Quantity:**
- Total Quantity = SUM(Sales_Clean[Quantity])
- Context-aware measures ensure accurate aggregation across filters and visuals.

2.4 Validation

- Cross-checked totals at month, country, and customer levels against raw aggregates.

- Verified UK exclusion filters.
- Ensured correct chronological sorting (Jan → Dec).
- Confirmed Top N filters rank by **measure**, not raw column values.

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3. Visualization Design Principles

- **Tab structure:** Each executive question mapped to a dedicated page:
    - Q1_Revenue_2011
    - Q2_TopCountries
    - Q3_TopCustomers
    - Q4_Demand
- **Color coding:**
    - Blue → Revenue visuals
    - Green → Quantity visuals
- **Executive readability:**
    - Titles/subtitles aligned with executive requests.
    - Labels ON (currency for revenue, whole numbers for quantity).
- **Ranking logic:** Top N filters applied using measures to ensure aggregated accuracy.
- **Consistency:** Uniform formatting across all visuals for professional presentation.

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4. Detailed Analysis & Insights

Q1: Monthly Revenue – 2011

- **Visual:** Line chart (Jan–Dec 2011).
- **Findings:**
    - Seasonal peaks in late-year months (holiday demand).
    - Mid-year troughs highlight promotional opportunities.
- **Strategic implication:**
    - Align inventory and campaigns with peak months.
    - Introduce mid-year promotions to stabilize revenue flow.

Q2: Top 10 Countries by Revenue (Excl. UK, with Quantity)

- **Visual:** Clustered bar chart ranking top 10 countries by revenue, with quantity shown.

- **Findings:**
    - High-value markets: Strong revenue per unit (premium positioning).
    - Volume markets: High demand but lower revenue per unit (margin optimization needed).
- **Strategic implication:**
    - Expand premium offerings in high-value markets.
    - Optimize pricing and logistics in volume-driven markets.

Q3: Top 10 Customers by Revenue

- **Visual:** Bar chart ranking top 10 customers by revenue.
- **Findings:**
    - Pareto effect: Small set of customers drive disproportionate revenue.
    - Guest vs registered segmentation clarifies retention vs acquisition focus.
- **Strategic implication:**
    - Launch tiered loyalty/account programs for top customers.
    - Target mid-tier customers with tailored bundles to elevate them into top tier.

Q4: Demand by Country (Excl. UK)

- **Visuals:**
    - Bar chart showing total quantity per country.
    - Pie chart showing % share of demand.
- **Findings:**
    - High-quantity countries drive operational load regardless of revenue mix.
    - Pie chart clarifies demand concentration vs diversification.
- **Strategic implication:**
    - Optimize fulfillment and stock strategies in high-demand geographies.
    - Differentiate service models to reduce costs and stockouts.

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5. Expansion Opportunities

- **Premium markets:** Deepen product depth, bundles, and upsell strategies.
- **Volume markets:** Improve margins via pricing architecture and logistics optimization.

- **Customer concentration:** Retain top accounts with bespoke programs; elevate mid-tier customers.
- **Seasonality leverage:** Stage inventory and campaigns around late-year peaks; test mid-year uplift initiatives.

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6. Risks & Mitigations

- **Data completeness:** Guest customers may obscure retention opportunities → monitor anonymous share.
- **Country labeling drift:** Automate normalization in ETL pipelines.
- **Returns impact:** Separate net vs gross revenue to avoid overstated performance.
- **Forecasting caution:** Use multi-year history for reliable projections.

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7. Deliverables

- **Power BI file (.pbix):** Contains all visuals, each on its own tab.
- **Executive report:** This document, summarizing methodology, insights, and expansion strategy.

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8. Conclusion

This project demonstrates a rigorous end-to-end analytics workflow: from raw data ingestion and cleaning to executive-ready visualization and strategic interpretation. The findings provide a clear roadmap for expansion, balancing premium market opportunities, volume market optimization, customer concentration strategies, and seasonal demand alignment.