Functional Specification Document: Sales Performance Dashboard

1. Project Overview

The Sales Performance Dashboard aims to provide stakeholders with an advanced analytics platform to monitor, analyze, and optimize sales performance. It will incorporate key metrics, dynamic visualizations, and interactive features to support data-driven decision-making. The dashboard will leverage advanced Power BI components and DAX calculations for a robust, scalable, and high-performing solution.

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2. Key Objectives

1. **Comprehensive Sales Metrics:**
    - Present core KPIs, including Total Revenue, Units Sold, Gross Margin, Average Order Value, and Year-over-Year Growth.
2. **Dynamic Ranking & Top N Analysis:**
    - Implement dynamic rankings for sales representatives, products, and regions using DAX (`RANKX`) and `EARLIER()` for row-level pre-calculated rankings.
3. **Advanced Customer Segmentation:**
    - Use calculated tables and DAX to segment customers into High, Mid, and Low-value groups.
    - Employ `EARLIER()` for dynamic categorization based on cumulative sales.
4. **Sophisticated Time Intelligence:**
    - Incorporate reusable calculation groups for YTD, MTD, QTD, and YoY metrics.
    - Highlight rolling averages and moving totals to analyze trends effectively.
5. **Interactive Scenario Analysis:**
    - Enable parameter-driven "What-If" analysis for exploring potential business scenarios like target adjustments.
6. **Multi-Level Drillthrough:**
    - Facilitate drillthrough from summary views to detailed data by region, product, or customer hierarchy levels.
7. **Optimized Data Model:**
    - Ensure optimal performance with a well-designed star schema and DAX variables to streamline calculations.
8. **Dynamic UI Elements:**
    - Provide contextual tooltips, titles, and conditional formatting for enhanced user experience.
9. **Role-Based Data Access:**
    - Enforce row-level security (RLS) for data privacy based on user roles.
10. **Innovative AI Features:**
    - Integrate AI visuals like decomposition trees and anomaly detection for deeper insights.

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3. Data Requirements

- **Source Data:** AdventureWorks2022 database

- **Tables Used:**
  - SalesOrderHeader
  - SalesOrderDetail
  - Product
  - Customer
  - Territory
  - Date
- **Data Transformations:**
  - Cleaning nulls and duplicates.
  - Creating calculated columns for rankings and categorization.
  - Adding calculated tables for segmentation and aggregations.

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4. Dashboard Features

- **Visualizations:**
  - KPI cards for core metrics
  - Line charts for trend analysis
  - Bar/column charts for Top N analysis
  - Donut charts for customer segmentation
  - Decomposition trees for AI insights
- **Interactivity:**
  - Slicers for filtering by date, region, and product
  - Drillthrough pages for detailed exploration
  - Dynamic “What-If” parameter controls

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5. Performance Optimization

- Use of DAX variables to reduce query complexity.
- Optimization of relationships in the data model.
- Minimizing the use of calculated columns where possible.
- Leveraging Tabular Editor for calculation groups.

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6. Security Implementation

- Dynamic Row-Level Security (RLS) using DAX functions like `USERPRINCIPALNAME()`.
- Role definitions for region-based access.

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7. Deliverables

1. Fully interactive Power BI Sales Performance Dashboard.
2. Documentation of DAX calculations and modeling logic.