Power BI Report Documentation

Prepared for: Interview Submission

Data Source: AdventureWorks Dataset

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1) Executive Summary

This report was built using AdventureWorks datasets, including sales, customers, products, territories, and returns data. The objective is to create a clean star-schema data model, develop business-ready DAX measures, and design dashboards for analysis of sales, returns, and customer insights.

Deliverable: A Power BI (.pbix) file with a clean data model, DAX measures, and interactive dashboards (Overview, Customer Analysis, Product Analysis, Territory Analysis).

2) Data Sources & Structure

• Sales Data (2015, 2016, 2017): OrderDate, StockDate, OrderNumber, ProductKey, CustomerKey, TerritoryKey, OrderQuantity.

• Customers: CustomerKey, FirstName, LastName, Gender, MaritalStatus, AnnualIncome, BirthDate, EducationLevel, Occupation.

• Products: ProductKey, ProductName, ProductSubcategoryKey, UnitPrice.

• Product Category & Subcategory tables.

• Territories: SalesTerritoryKey, Region, Country, Continent.

• Returns: ReturnDate, ProductKey, TerritoryKey, ReturnQuantity.

3) Data Preparation (Power Query)

• Unified sales tables (2015-2016-2017) using Append Queries → Sales_All.

• Converted data types (dates, numbers, income).

• Handled nulls, Excel serial dates, and encoding issues.

• Created SalesAmount = OrderQuantity * UnitPrice.

4) Data Model (Star Schema)

• Fact Table: Sales.

• Dimensions: Products, Customers, Territories, DateTable, Returns.

• Relationships established: ProductKey, CustomerKey, TerritoryKey, Date.

5) Key Measures (DAX)

Total Sales = SUM(Sales_All[OrderQuantity])

Net Sales = [Total Sales] - [Total Returns]

YoY Growth % = DIVIDE([Total Sales] - CALCULATE([Total Sales], DATEADD('Date'[Date], -1, YEAR)), CALCULATE([Total Sales], DATEADD('Date'[Date], -1, YEAR)), 0)

Customer Age = DATEDIFF(Customers[BirthDate], TODAY(), YEAR)

6) Dashboard Visuals

Overview Page: KPIs (Total Sales, Net Sales, Returns, Active Customers), Revenue Trend (Line Chart), Top Products (Bar Chart), Hierarchical Matrix (Category → Subcategory → Product).

Customer Analysis Page: Top 10 Customers by Sales, Customer Segmentation by Annual Income Bands, Age Distribution.

Product Analysis Page: Sales vs Returns by Product Category/Subcategory.

Territory Analysis Page: Sales by Region/Country (Map).

Navigation: Page Navigation buttons were added to move between report pages.

7) Improvements & Adjustments

• Replaced Pie Charts (Gender & Marital Status) with Income Bands & Education Level distribution (more business-oriented).

• Added legend for conditional formatting in the financial-style Matrix.

• YoY Growth% calculation improved to return 0 instead of BLANK.

• Built a custom DateTable for accurate time intelligence (YoY, YTD, MTD).

• Added comparison with Targets/Budget (using additional table).

Appendix: DAX Measures

Sales & Returns

```
Total Sales = SUM(Sales_All[OrderQuantity])

Total Sales Amount = SUMX(Sales_All, Sales_All[OrderQuantity] *
Sales_All[UnitPrice])

Total Returns = SUM(AdventureWorks_Returns[ReturnQuantity])

Total Returns Amount = SUMX(AdventureWorks_Returns,
AdventureWorks_Returns[ReturnQuantity] * RELATED(Products1[UnitPrice]))

Net Sales = [Total Sales Amount] - [Total Returns Amount]

Return Rate % = DIVIDE([Total Returns], [Total Sales], 0)
```

Customer Analysis

```
Active Customers = DISTINCTCOUNT(Sales_All[CustomerKey])

Avg Sales per Customer = DIVIDE([Total Sales Amount], [Active Customers], 0)

Customer Age = DATEDIFF(Customers[BirthDate], TODAY(), YEAR)

Top Customer Sales =
VAR Summary = ADDCOLUMNS(SUMMARIZE(Customers, Customers[CustomerKey],
Customers[CustomerName]), "SalesAmt", [Total Sales Amount])
RETURN MAXX(TOPN(1, Summary, [SalesAmt], DESC), [SalesAmt])

Top Customer Name =
VAR Summary = ADDCOLUMNS(SUMMARIZE(Customers, Customers[CustomerKey],
Customers[CustomerName]), "SalesAmt", [Total Sales Amount])
RETURN MAXX(TOPN(1, Summary, [SalesAmt], DESC), Customers[CustomerName])
```

Time Intelligence

```
YoY Growth % =
VAR CurrSales = [Total Sales Amount]
VAR PrevSales = CALCULATE([Total Sales Amount], DATEADD('Date'[Date], -1,
YEAR))
RETURN DIVIDE(CurrSales - PrevSales, PrevSales, 0)

MTD Sales = CALCULATE([Total Sales Amount], DATESMTD('Date'[Date]))
```

```
YTD Sales = CALCULATE([Total Sales Amount], DATESYTD('Date'[Date]))

Last Month Sales = CALCULATE([Total Sales Amount], DATESINPERIOD('Date'[Date],
MAX('Date'[Date]), -1, MONTH))
```

Product / Category

```
Top Product by Sales =
VAR ProdTable = ADDCOLUMNS(SUMMARIZE(Products1, Products1[ProductKey],
Products1[ProductName]), "SalesAmt", [Total Sales Amount])
RETURN MAXX(TOPN(1, ProdTable, [SalesAmt], DESC), Products1[ProductName])

Top Subcategory Sales =
CALCULATE([Total Sales Amount], TOPN(1,
VALUES(AdventureWorks_Product_Subcateg[SubcategoryName]), [Total Sales
Amount], DESC))
```

Territories

```
Sales by Region = SUMX(Sales_All, Sales_All[OrderQuantity] *
Sales_All[UnitPrice])

Top Region by Sales =
VAR RegTable = ADDCOLUMNS(SUMMARIZE(AdventureWorks_Territories,
AdventureWorks_Territories[Region]), "SalesAmt", [Total Sales Amount])
RETURN MAXX(TOPN(1, RegTable, [SalesAmt], DESC),
AdventureWorks_Territories[Region])
```