FORTUDE

Case Study for Analytics and BI Assessment

Version 1.0

CONTENTS

1. GETTING READY 3

2. SCENARIO 3

3. TECHNICAL REQUIREMENTS 3

4. BUSINESS REQUIREMENTS 3

4.1 DATA WAREHOUSE 3

4.2 DATA INTEGRATION 4

4.3 SEMANTIC DATA MODEL 4

4.4 ANALYTICAL REPORT 4

4.5 NAMING CONVENTIONS AND STANDARDS 5

1. GETTING READY

Install SQL Server 2019 Developer Edition on your local computer. To make life easier, you only need to install the Database Engine and related shared components.

Download and restore the AdventureWorks2019 OLTP database from Microsoft Docs on your new installed SQL Server. You could do this once you install Azure Data Studio, which you can also use later to write your queries. This database will be your source system that houses sales information for AdventureWorks, a fictional company selling bicycles and related products.

You should also possess a Microsoft Azure subscription. You could sign up for a free subscription or use one that you already have.

You are encouraged to use Microsoft Docs, blogs, whitepapers and related literature as reference materials to come up with the best design and solution for this assessment.

2. SCENARIO

AdventureWorks requires sales analytics to be formulated in a data warehouse from the sales information system to be used across the business. The data warehouse should be deployed to the cloud and will serve as the central analytics hub for AdventureWorks. You need to ensure the following technical and business requirements are fulfilled when you develop the data warehouse:

3. TECHNICAL REQUIREMENTS

- The cloud platform chosen for the solution is Microsoft Azure.
- The data warehouse should be created on a serverless Azure SQL Database instance.
- Data should be integrated into the data warehouse using Azure Data Factory.
- The semantic model and report(s) should be created using Microsoft Power BI

4. BUSINESS REQUIREMENTS

AdventureWorks business analysts usually analyze the following metrics on a regular basis for their reports. What they analyze and how they do it is summarized in Table 1.

Measure	Analysis	Filters
Number of units of items ordered	By products, Year to date, Month to date, By territories, Daily trend	Product category and subcategories, and current year
Sales value of items ordered		
Number of sales orders	Year to date, Month to date, By territories	Current year
Average value per order		
Number of sales orders due		

Table 1

4.1 Data Warehouse

You need to facilitate these metrics by implementing appropriate **facts** in the data warehouse. You also need to consider how the analysts would slice, dice and filter this information, so that you can determine and implement the right **dimensions** in the data warehouse.

1. Draw a simple enterprise bus matrix to map the facts and dimensions that you have identified. Refer to the source database to get a better understanding as well, if you think it is required.
2. Create a star schema on the data warehouse, referring to the enterprise bus matrix, to store the fact and dimension data that you have identified.

Hint: Transactional data for sales orders are found in the **Sales.SalesOrderHeader** and **Sales.SalesOrderDetail** tables of the source database. The source database possesses accurate referential integrity amongst its tables, that you can use to identify dimension sources.

4.2 Data Integration

Create data integration pipelines to populate the data warehouse on a nightly basis.

1. You need to design the pipelines such that only new transactions are loaded daily.
2. When a territory or its attributes are updated at the source, the relevant data on the data warehouse also needs to be updated to reflect the changes.
3. When a product or its attributes are updated at the source, the relevant data on the data warehouse should keep track of the history of the product.

4.3 Semantic Data Model

Create a semantic data model that you will use to perform business analysis. The requirements from Table 1 needs to be considered here.

In addition, sales analysts would like to use their sales targets spreadsheet (*AnnualTargets.xlsx*) for the requirement in Table 2.

Measure	Analysis	Filters
Sales targets vs sales order value	By product categories, Year to date, Month to date, By territories, Daily or monthly trend	Current year, territory

Table 2

Publish the semantic data model to powerbi.com

4.4 Analytical Report

Create an analytical report that showcases using the semantic data model that you created:

1. Showcases all sales measures for the current year, with high-level breakdowns as seen appropriate on the main page. Detailed analysis on subsequent pages as appropriate for effective analysis.
2. Country-wise analysis on a map, and an interesting analysis using a complex visual (i.e. not bar, column, line, pie) is also required.

Refer to Table 1 and Table 2 to get an understanding of how data is analyzed and filtered.

Publish the report to powerbi.com

4.5 Naming conventions and standards

Ensure that standard naming and design conventions are followed:

- Appropriate schemas for different kinds of tables
- Appropriate naming conventions for tables names and column names
- Appropriate data types.
- The right types of keys.
- Appropriate naming conventions for data pipelines.
- Appropriate naming conventions and standards for pipeline components.
- Appropriate naming conventions for semantic model components
- Appropriate naming conventions for reports.
- Ensure the semantic model and reports are developed as separate files.