Business Requirements Document (BRD)

Project Title:

Implementation of Data Warehouse for Northwind Traders Dataset

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Date:

September 30, 2024

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1. Introduction

This Business Requirements Document (BRD) outlines the business needs and requirements for the implementation of a data warehouse for the Northwind Traders dataset. Northwind Traders is a fictitious company that imports and exports specialty foods worldwide. The project involves setting up a data warehouse using the Northwind dataset, implementing ETL processes, and building an analytics solution with Power BI and an SSAS tabular model.

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2. Business Objectives

The objectives of this project include:

- **Improved Reporting:** Enable dynamic reporting on customers, suppliers, orders, and products.
- **Better Decision-Making:** Facilitate data-driven decision-making by consolidating business data into a centralized data warehouse.
- **Advanced Analytics:** Provide tools for forecasting, trend analysis, and performance metrics using SSAS tabular models and Power BI.
- **Efficient Data Management:** Streamline data extraction, transformation, and loading (ETL) processes to ensure consistency and accuracy of business data.

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3. Project Scope

This project covers the following stages:

- **Dataset Selection:** Identify and prepare the Northwind dataset for use.
- **Business Requirements:** Define the key business needs for data integration and analytics.
- **Data Modeling:** Create the data warehouse's conceptual, logical, and physical models.
- **ETL Process:** Implement an ETL pipeline using SSIS to load data from source to staging, and from staging to the data warehouse.
- **Administration:** Automate and manage SSIS package executions and monitoring.
- **Analytics:** Build an SSAS tabular model for analysis and a Power BI dashboard for data visualization.

4. Project Stages

4.1. Dataset Selection

The Northwind dataset includes:

- **Suppliers:** Information about vendors supplying products.
- **Customers:** Customer records, including contact details and location.
- **Employees:** Employee data is used to track employee details.
- **Products:** Product information, including categories and suppliers.
- **Shippers**: Data on shippers used to deliver products.
- **Orders and Order Details:** Sales transactions, including order dates and products ordered.

4.2. Business Requirements

- **Reporting:** Detailed reporting on product sales, customer orders, and supplier performance.
- **KPI Tracking:** Track KPIs such as total sales by product category, sales growth, and customer retention.
- **Analytics:** Enable advanced analytics such as trend forecasting, sales performance, and inventory optimization.

4.3. Data Modeling

4.3.1. Conceptual Model

- High-level understanding of business entities such as **Customers**, **Orders**, **Products**, **Employees**, **Shippers**, and **Suppliers**.
- Relationships between these entities will define how data is structured in the warehouse.

4.3.2. Logical Model

- **Dimensional Modeling:** Star schema to structure data for analytical queries.
  - **Fact Tables:** Store quantitative data (e.g., sales transactions).
  - **Dimension Tables:** Store descriptive data (e.g., products, customers, employees).

4.3.3. Physical Model

- Create the actual tables, columns, and relationships in the database system.
- Optimize the database for query performance, indexing, and partitioning.

4.4. ETL Process

4.4.1. ODS (Operational Data Store)

- Data extracted from the Northwind dataset is loaded into the Operational Data Store (ODS) for real-time data processing and validation.

4.4.2. Stage

- Intermediate storage where raw data is transformed before loading it into the data warehouse.
- Perform data cleaning, standardization, and validation in this layer.

4.4.3. Data Warehouse

- The final storage is where data is loaded from staging after transformation.
- Organized into Fact and Dimension tables using a star schema for fast querying.

4.5. Administration

Automation

- **Automate SSIS Package Runs:** Configure scheduled execution of SSIS packages to automate ETL processes. The SSIS packages will be scheduled to run at 9:00 PM daily to ensure timely updates of the data warehouse.

Job Monitoring and Alerts

- **Tracking Progress of Scheduled Jobs:** Implement monitoring to track the progress of ETL jobs and ensure successful completion.
- **Alert System:** Set up an alert system to notify users via email or SMS when scheduled ETL jobs fail or experience delays.

4.6. Analytics

SSAS Tabular Model

- **Build SSAS Tabular Model:** Create a tabular model in SQL Server Analysis Services (SSAS) for advanced analytical processing.
- The model will allow business users to slice and dice data based on dimensions like **Product**, **Customer**, **Supplier**, and **Time**.

Power BI Dashboard

- **Create a Power BI Dashboard:** Design a Power BI dashboard to visualize key metrics, including sales performance, customer orders, and supplier efficiency.
- The dashboard will support drill-downs for detailed analysis and customizable reporting options for end-users.

5. Non-Functional Requirements

- **Performance:** Ensure the data warehouse supports fast query execution, even with increasing data volumes.
- **Scalability:** Design the data warehouse and ETL processes to handle future growth.
- **Data Security:** Protect sensitive data (e.g., customer and employee data) and ensure that only authorized users have access.
- **High Availability:** Ensure minimal downtime for the data warehouse and the automation of ETL jobs.

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6. Stakeholders

- **Digital Egypt Pioneers Initiative, NTI:** Requested the Northwind Traders data warehouse project and will be monitoring its progress to ensure alignment with strategic goals.

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7. Assumptions

- The Northwind dataset is reliable and comprehensive.
- The project team has access to all required tools (SQL Server, SSIS, SSAS, Power BI).
- The infrastructure for the data warehouse is in place and supports scaling.

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8. Constraints

- The project must be completed within the allocated time.
- The BI tool chosen must align with the existing technical ecosystem.

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9. Risks

- **Data Quality Issues:** Poor data quality might require additional cleaning.
- **System Performance:** Inadequate infrastructure could impact performance.
- **Job Failures:** If scheduled ETL jobs fail, data could be delayed.

10. Deliverables

- **Data Warehouse Design:** Schema and architectural design.

- **ETL Processes:** Fully functional ETL pipelines.
- **SSAS Tabular Model:** Analytical model for data slicing.
- **Power BI Dashboard:** Interactive reports and dashboards for end-users.
- **Documentation:** User guides and technical documentation.

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11. Timeline and Milestones

Milestone	Target Date
Project Kickoff	September 30, 2024
Data Modeling Completion	October 1, 2024
ETL Process Setup	October 3, 2024
SSAS Tabular Model Creation	October 3, 2024
Power BI Dashboard Completion	October 4, 2024
Final Delivery & Go-Live	October 5, 2024