**Portfolio Project: Cloud Architecture for Wholesale World**

**Project Overview**

Wholesale World is a global membership-based retailer offering high-quality products at competitive prices. This project designs a scalable and efficient cloud-based solution to optimize data management, improve customer experience, and enhance decision-making.

**Mission**

To streamline and optimize wholesale warehouse data flow processes to ensure real-time, accurate, and actionable insights for improving operational efficiency, enhancing customer satisfaction, and driving sustainable growth.

**Objectives**

* **Data-Driven Decisions:** Empowering leadership with insights into sales trends and financial health.
* **Customer Satisfaction:** Using predictive analytics to deliver personalized recommendations.
* **Operational Excellence:** Leveraging robust data pipelines to optimize inventory and supply chain processes.

**Vision Diagram**

**Data Sink**

**Data Source**

A diagram of a company

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Diagram above showcases:

1. Data sources (e.g., on-premise, membership, e-commerce, website tracking).
2. Data sinks (e.g., Power BI dashboards, marketing channels, live shipping dashboards).

A diagram of a cloud architecture

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**Wholesale World Cloud Architecture**

The cloud solution is built using **Microsoft Azure Services** ensuring scalability and cost efficiency.

1. **Data Sources**:
   * **Transactional Data:** From sales, inventory, and membership systems.
   * **Behavioral Data:** Website tracking and customer interactions.
2. **Cloud Components**:
   * **Ingestion Layer:** Azure Event Hub and Azure Data Factory for real-time and batch data ingestion.
   * **Storage Layer (Bronze):** Raw data storage for auditing and archival.
   * **Transformation Layer (Silver):** Azure Databricks and Delta Lake for data cleaning and structuring.
   * **Analytics Layer (Gold):** Aggregated data stored in Azure Synapse Analytics for ready-to-use insights.
3. **Consumption**:
   * Business insights delivered via **Power BI dashboards** and machine learning models.

**Data Pipeline**

A diagram of a pipeline strategy

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**End-to-End Data Flow Strategy**:

1. **Data Ingestion**:
   * Capture real-time and batch data from e-commerce and sales databases
   * Utilize Azure services for seamless and reliable ingestion.
2. **Data Transformation**:
   * Perform cleaning and curation in Azure Databricks.
   * Use Delta Lake for schema management and transaction consistency.
3. **Data Aggregation and Analysis**:
   * Aggregate curated datasets in the Gold Layer using Azure Synapse Analytics.
   * Prepare actionable insights for stakeholders.
4. **Data Consumption**:
   * Visualize insights via Power BI for inventory, finance, and customer analytics.
   * Feed predictive models with curated data for advanced analytics.

**Conclusion**

This architecture provides Wholesale World with a robust framework for real-time analytics, cost optimization, and scalability. By leveraging Microsoft Azure, the solution aligns with the organization’s mission to drive innovation and sustainable growth in wholesale operations.