



# **Eco Cleaning Supply**

## **Cloud Architecture Project**

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## 1. Introduction:

The Eco Cleaning Supply Cloud Architecture project is a modern, scalable solution designed to centralize and analyze data from multiple sources. By leveraging advanced Azure technologies, this architecture enables real-time decision-making, data-driven insights, and improved operational efficiency. The project focuses on creating a robust pipeline and intuitive dashboards to enhance business processes, customer experience, and strategic decision-making.

## **2. Mission and Objectives:**

### **Mission:**

To establish a cloud-based data ecosystem that integrates diverse data sources, provides real-time insights, and drives operational excellence for Eco Cleaning Supply.

### **Objectives:**

1. Centralize data from multiple sources for better management.
2. Enable real-time decision-making through advanced analytics.
3. Leverage machine learning for predictive insights.
4. Automate workflows to save time and resources.
5. Provide a scalable and cost-efficient cloud infrastructure.

### 3. Proposed Cloud Architecture:

#### Data Sources:

**Sources** are systems or platforms that provide data input into the ETL (Extract, Transform, Load) process.

Source	Definition	Data Type
Retail Stores	Data from point-of-sale systems, including requests for cleaning supplies and inventory updates.	<b>Structured</b> (e.g., sales records, inventory requests)
E-commerce	Orders and requests made through the online store.	<b>Structured</b> (e.g., transaction logs, customer profiles)
Customer Feedback	Customer Experience and complaint data captured through forms or tickets.	<b>structured</b> (e.g., forms stored as JSON/XML)
Suppliers (Information)	Supplier data, including raw material availability, delivery schedules, and pricing.	<b>Structured</b> (e.g., tabular supplier data in databases)
Currency Data	Exchange rate data fetched from APIs for multi-currency support.	<b>Structured</b> (e.g., real-time API responses in JSON/XML)
Social Media Data	Insights are used to optimize advertising strategies, predict social media trends, and measure brand engagement	<b>structured</b> (e.g., free-text customer reviews)



## Data Sinks:

**Sinks** are systems or platforms that consume, or store processed data from the ETL process.

Sink	Definition	Data Type
Inventory System	Processed data about stock levels, inventory allocation, and reordering.	<b>Structured</b> (e.g., tabular format in relational databases)
Delivery Management System	Data for optimizing delivery routes, tracking deliveries, and driver assignments.	<b>Structured</b> (e.g., logistics tables, real-time GPS feeds)
Customer Experience Dashboards	Aggregated and visualized data for monitoring customer sentiment and satisfaction trends.	<b>Structured</b> (e.g., visual analytics tools like Power BI)
Marketing Insights	Marketing campaigns, analyzing trends, gaining performance insights, and leveraging social media data to understand audience behavior and drive targeted strategies.	<b>Structured</b> (e.g., JSON-based marketing reports)
Accounting System	Consolidated financial data for budgeting, expense tracking, and profit analysis.	<b>Structured</b> (e.g., ERP or financial systems)
Operational Dashboard	Data insights to identify inefficiencies, reduce operational costs, and forecast savings.	<b>Structured</b> (e.g., reports in Excel or BI dashboards)

## Tools and Technologies

1. Azure Synapse Analytics: Central platform for integrating, processing, and analyzing data.
2. Azure Data Factory: Automates data ingestion workflows from diverse sources.
3. Azure Machine Learning: Builds predictive models for trends and demand forecasting.
4. Power BI: Creates real-time dashboards for actionable insights.

## Scalability and Real-Time Insights

The architecture separates computer and storage layers, ensuring that resources can be scaled independently based on business needs. Real-time dashboards provide live monitoring of key metrics, enabling proactive decision-making.

## 4. Proposed Pipeline

### Phase 1: Data Collection and Ingestion

#### Objective:

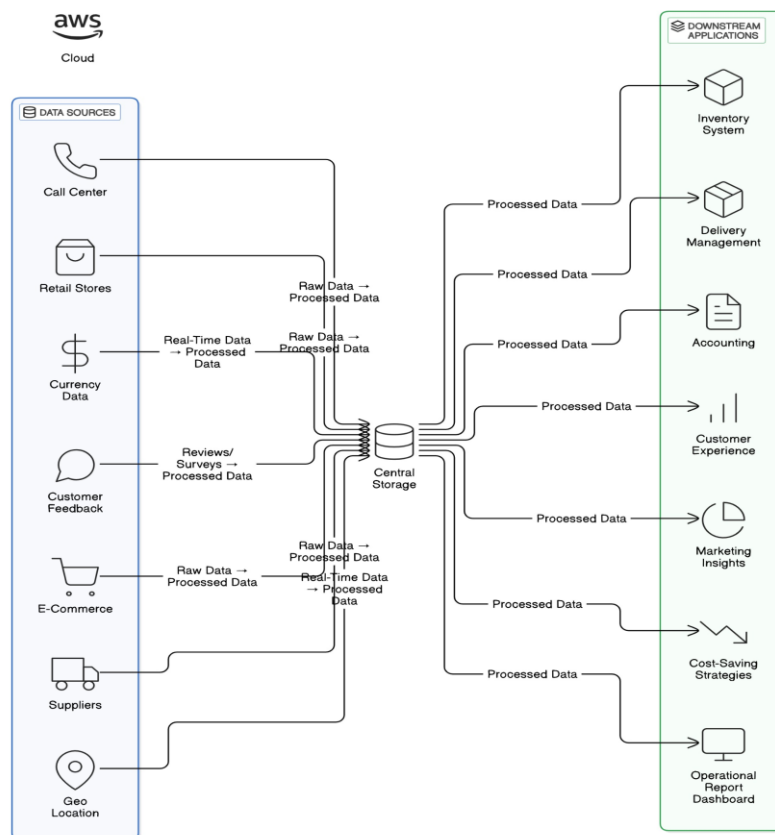
Raw data is transformed into usable information through processing pipelines.

Real-time data, like currency rates, is updated instantly for immediate use in relevant applications.

Insights are derived to support business functions like inventory control, marketing, and customer service.

#### Steps:

- Azure Data Factory is used to pull structured and unstructured data from sales, suppliers, customer feedback, and social media platforms.
- Data is ingested into Azure Blob Storage, serving as a raw data repository.



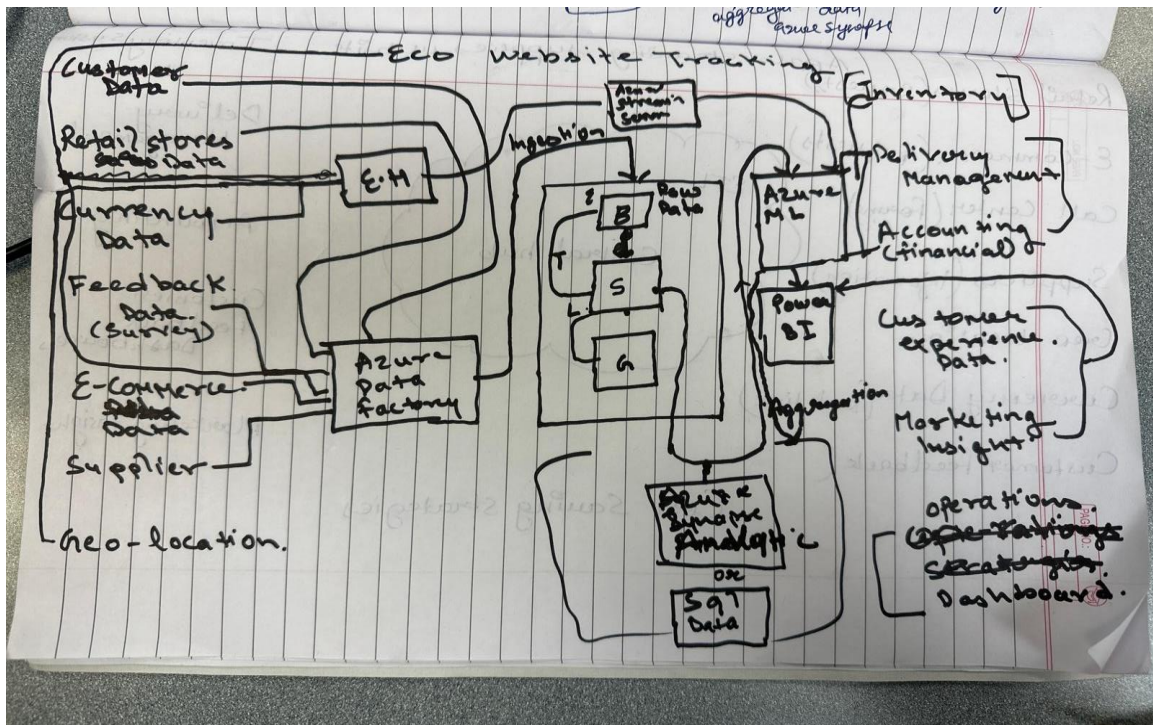


## Phase 2: Data Processing and Storage

**Objective:** Clean, transform, and organize data for analytics.

**Steps:**

- Data is preprocessed using Azure Synapse Analytics to remove inconsistencies, duplicate entries, and irrelevant information.
- Transformed data is stored in a Data Lakehouse, which combines the benefits of data lakes and warehouses.
- Advanced transformations are performed for aggregating metrics like sales trends, supplier efficiency, and customer satisfaction.

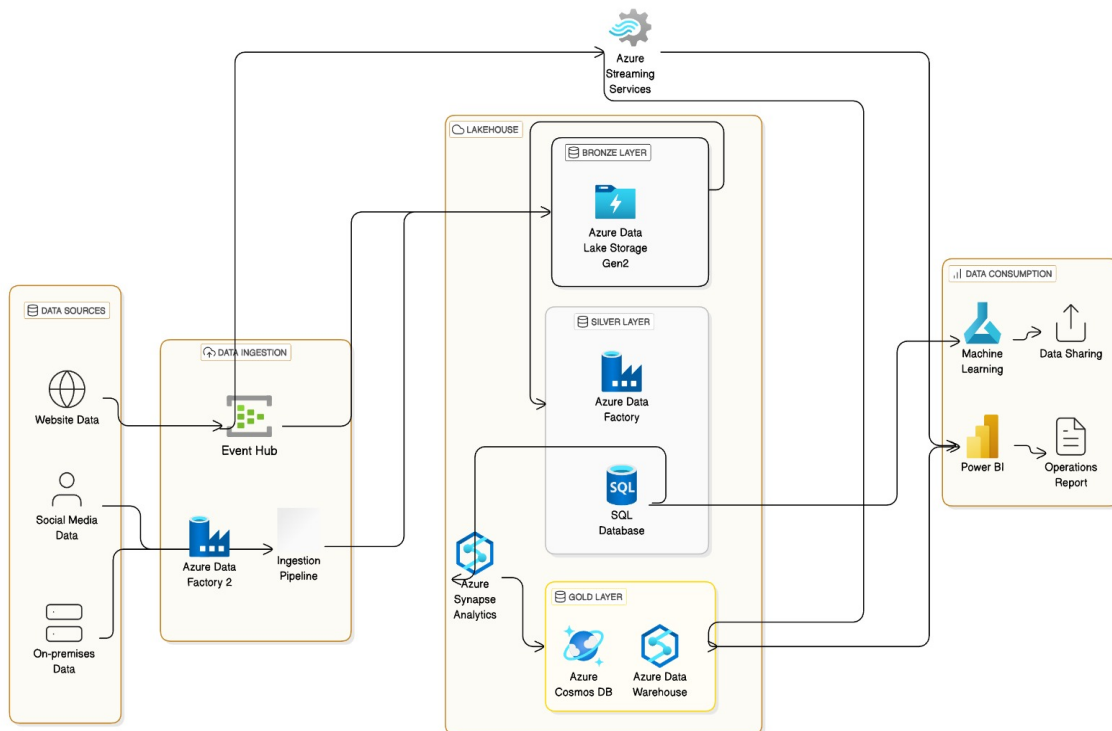


## Phase 3: Lakehouse Architecture

**Objective:** The architecture integrates diverse data sources (web, social media, on-premises) into a centralized Lakehouse system for structured storage and processing. It allows seamless access to processed data for machine learning, reporting, and operational insights, enabling data-driven decision-making across the organization.

### Steps:

- Real-Time Dashboards: Power BI visualizes key performance indicators (KPIs) such as sales performance, customer feedback, and supplier efficiency.
- Machine Learning Integration: Predictive models are implemented to forecast demand, identify inefficiencies, and recommend actions.
- Stakeholders access dashboards and reports to make data-driven decisions.



## 5. Benefits of the Cloud Solution

1. Centralized Data Management: All data sources are integrated into one system for easy access and analysis.
2. Real-Time Insights: Live dashboards ensure proactive decision-making and quick response to market trends.
3. Scalability: The system adapts to increased workloads without compromising performance.
4. Cost Efficiency: Pay-as-you-go pricing model reduces operational costs by optimizing resource usage.
5. Enhanced Analytics: Predictive models provide valuable insights into customer preferences and future demand.
6. Improved Operational Efficiency: Automated workflows save time and ensure consistency in processes.

## 6. Conclusion

The Eco Cleaning Supply Cloud Architecture project demonstrates how cloud technologies can transform data management and analytics. By leveraging Azure Synapse Analytics, Power BI, and other advanced tools, this architecture empowers decision-makers with real-time insights, predictive analytics, and scalable solutions. The proposed pipeline ensures seamless integration of data sources, efficient processing, and effective delivery of actionable insights.

This architecture not only improves operational efficiency but also positions Eco Cleaning Supply as a data-driven organization ready to tackle future challenges. With its scalable and cost-effective design, this solution is a blueprint for achieving business growth and customer satisfaction.