Article
on
SkyMart Express

Written by

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INTRODUCTION

Sky Mart Express uses top carriers and smart planning to ensure reliable, flexible, and on-time deliveries. Its global network and technology adapt to disruptions like weather or traffic, keeping your goods on the fastest route while reducing costs and complexity.
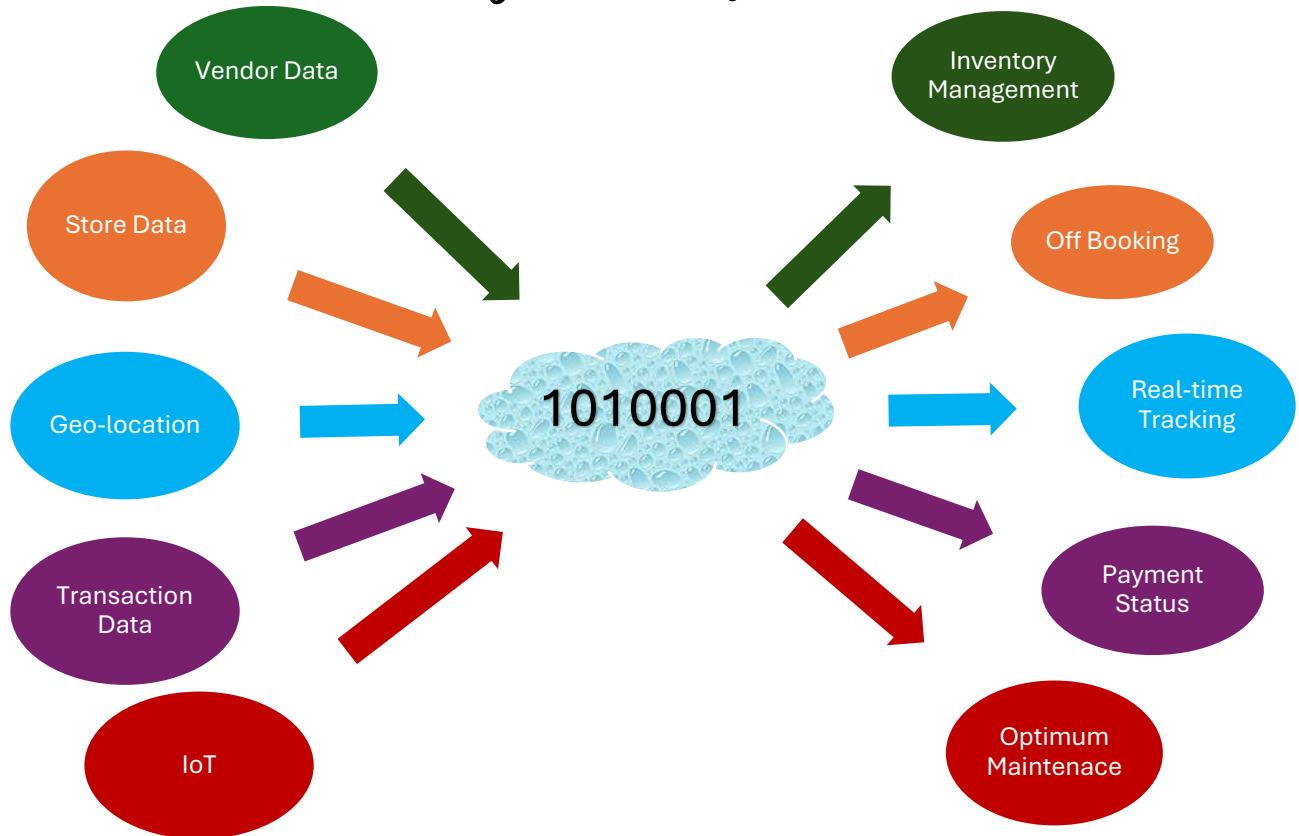
MISSION

Design a cloud system for Sky Mart that's reliable, fast, secure, and able to grow easily, supporting both its online store and data analysis needs.

OBJECTIVES

- **Optimize order processing** for faster and accurate transactions.
- Enable **real-time tracking** of inventory, orders, and customer interactions.
- Provide actionable insights into **market trends** for decision-making.
- Ensure **optimum utilization of resources** (staff, inventory, and infrastructure).
- Offer **personalized customer experiences** through recommendations and targeted campaigns.
- Deliver **enhanced reporting** to stakeholders for informed decision-making.

Design and Discovery Phase

Sky Mart Express

- Vendor Data
- Store Data
- Geo-location
- Transaction Data
- IoT

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- Inventory Management
- Off Booking
- Real-time Tracking
- Payment Status
- Optimum Maintenace

Data Sources Overview

1. Vendor Data
- **Type:** Structured
- **Flow:** Batch processing, as updates occur periodically.
- **Source:** Supplier portals, ERP systems, APIs.

2. Transaction Data
- **Type:** Structured
- **Flow:** Typically, batch but can also support real-time for payment success/failure tracking.
- **Sources:** E-commerce platforms, payment gateways, POS systems, CRM systems.

3. Internet of Things (IoT)
- **Type:** Structured
- **Flow:** Primarily streaming; may use batch for historical analysis.
- **Sources:** Smart sensors, GPS systems, IoT-enabled devices

4. Store Data
- **Type:** Structured and unstructured
- **Flow:** Batch, as updates are typically daily.
- **Source:** POS systems, store management software.

5. Geo-Location Data
- **Type:** Unstructured
- **Flow:** Streaming, as locations are updated live.
- **Source:** Mobile app GPS, third-party location APIs.

Key Deliverables

1. Inventory Management
- **What We Deliver:**
  - Low-stock alerts and predictive restocking.
  - Inventory turnover rates and real-time stock availability.
- **Delivery Method:**
  - Power BI Dashboards
  - Automated Reports
  - API Integration

2. Payment Status
- **What We Deliver:**
  - Detailed sales reports.
  - Payment success/failure analysis.
  - Refund and return insights.
  - Fraud detection reports for unusual transactions.
- **Delivery Method:**
  - Power BI Dashboards
  - Alerts
  - Automated Reports

3. Optimum Utilization of Resources
- **What We Deliver:**
  - Workforce and warehouse productivity analysis.
  - Delivery route efficiency and resource allocation plans.
- **Delivery Method:**
  - Power BI Dashboards
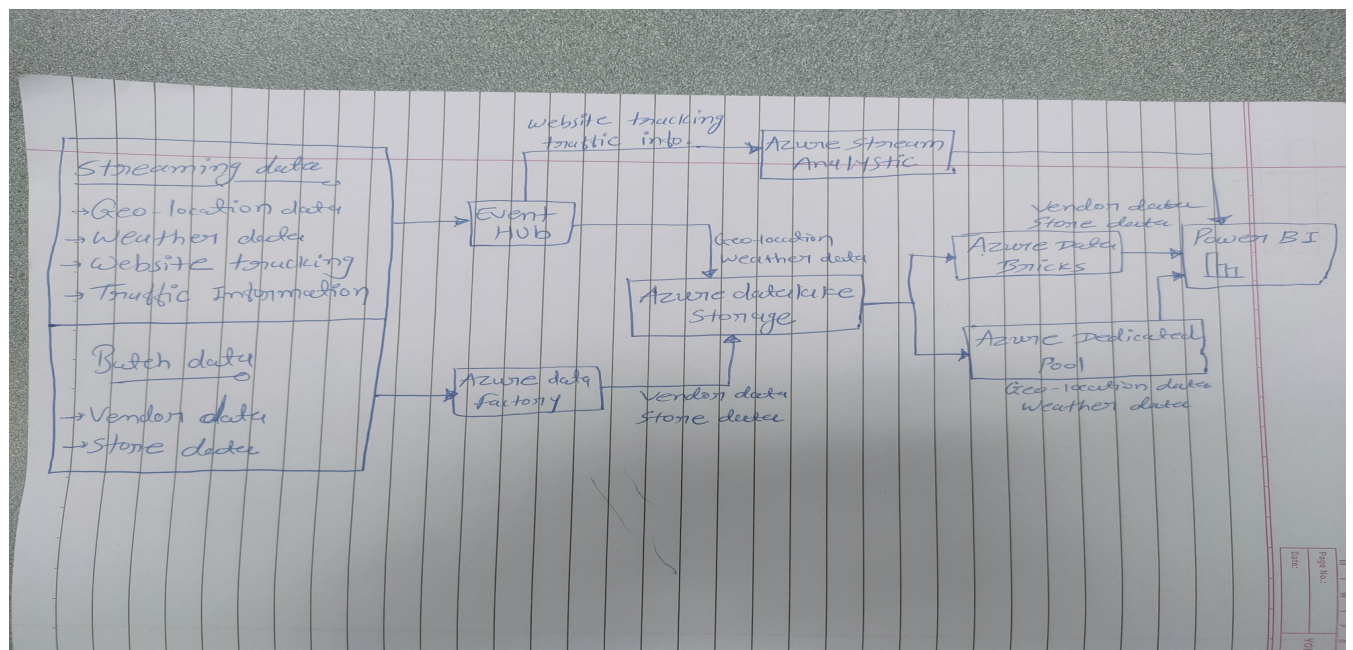 - Predictive Models
  - Alerts

4. Off-Booking

- **What We Deliver:**
    - Analysis of unfulfilled orders and stockouts.
    - Root cause reports for booking issues.

- **Delivery Medium:**
    - Power BI Dashboards
    - Alerts
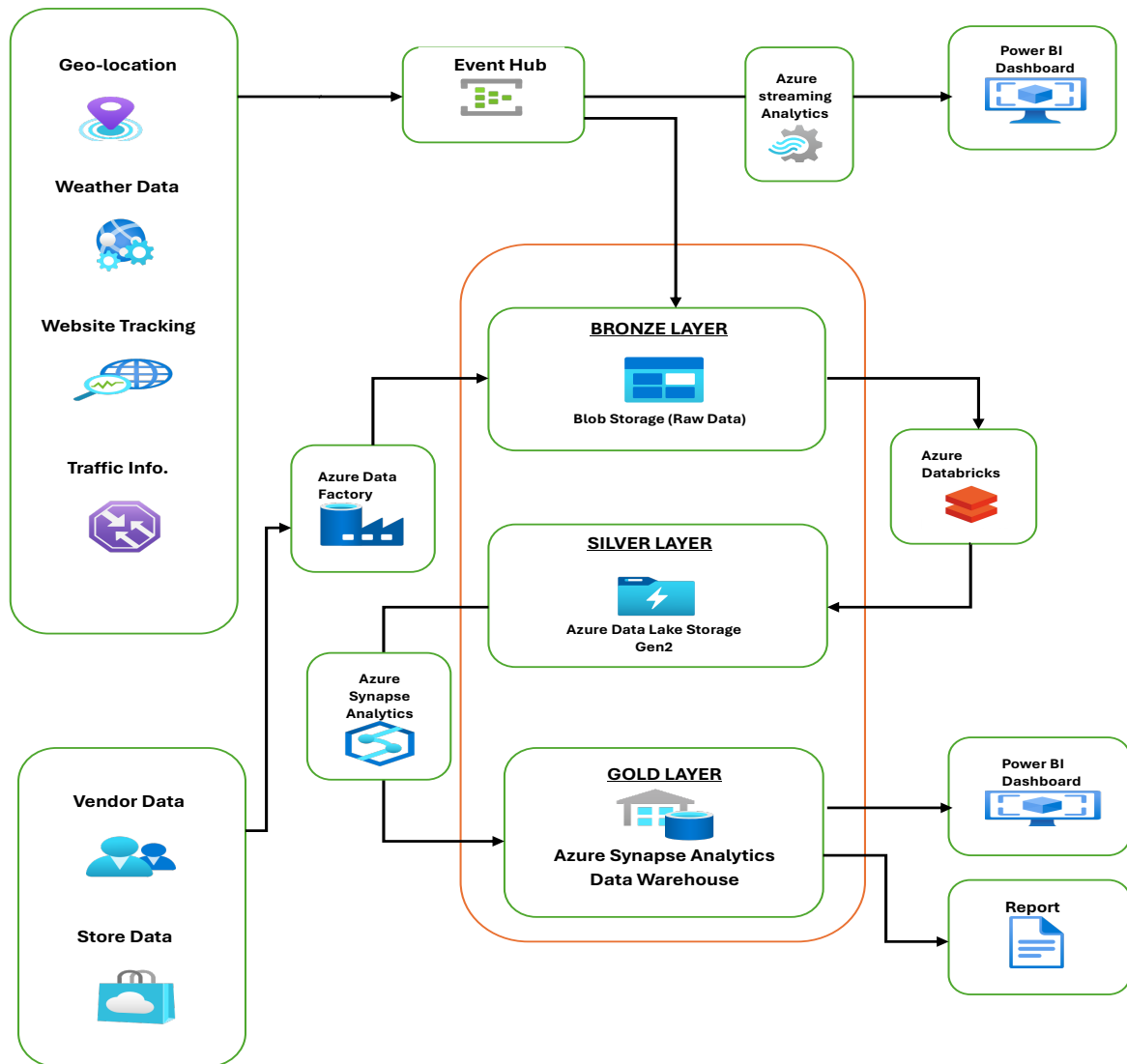   - Vendor Reports

5. Real-Time Tracking

- **What We Deliver:**
    - Live tracking of deliveries and inventory updates.
    - Geo-location data for targeted marketing or delivery route optimization.
- **Delivery Method:**
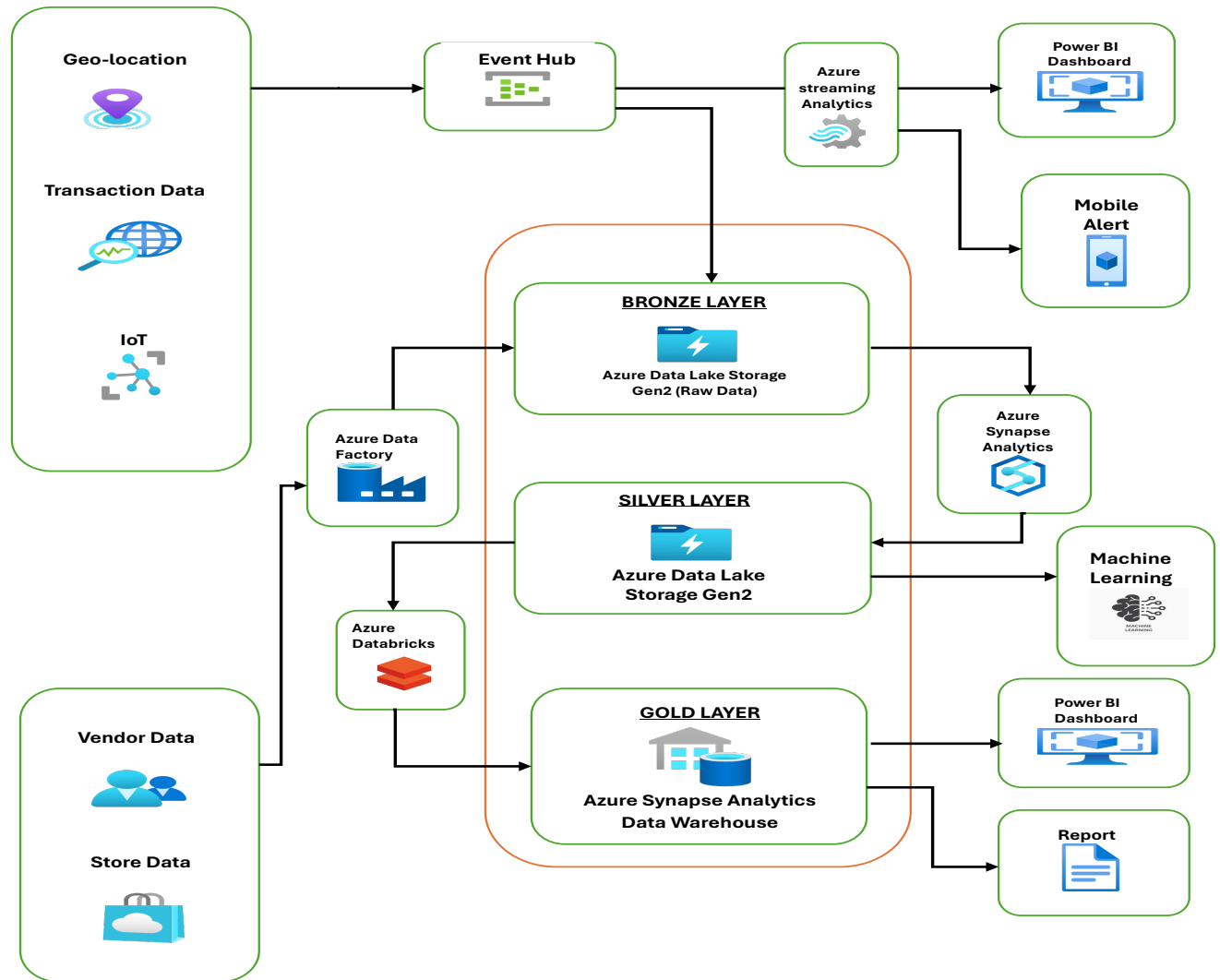   - Power BI Dashboards
    - Notifications

PHASE 1

PHASE 2

PHASE 3

Geo-location

Transaction Data

IoT

Event Hub

Azure streaming Analytics

Power BI Dashboard

Mobile Alert

Azure Data Factory

BRONZE LAYER

Azure Data Lake Storage Gen2 (Raw Data)

Azure Synapse Analytics

Azure Databricks

SILVER LAYER

Azure Data Lake Storage Gen2

Machine Learning

MACHINE LEARNING

Vendor Data

Store Data

GOLD LAYER

Azure Synapse Analytics Data Warehouse
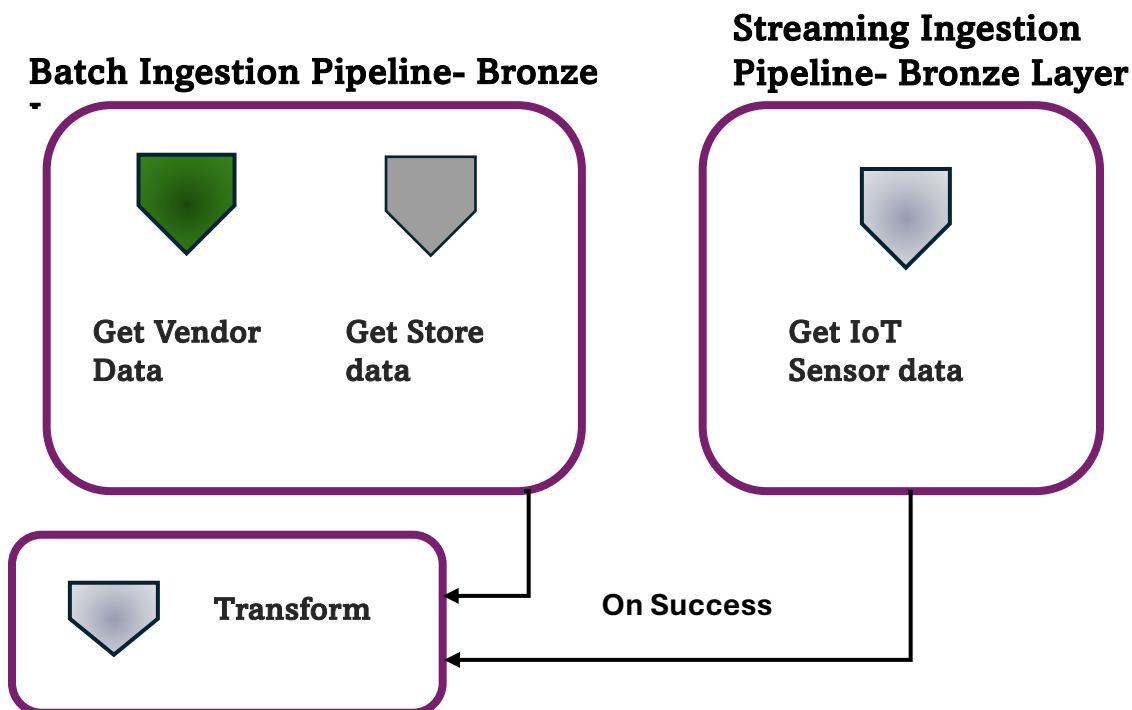
Power BI Dashboard

Report

Process of Creating Pipeline

We decided to create two ingestion pipelines:
1. batch ingestion and
2. streaming ingestion.

Each one of these pipelines will be built using a different set of Azure services.
- For batch ingestion, we will use Azure Data Factory, and
- for streaming ingestion, we will use Event Hub.

Batch Ingestion Pipeline- Bronze

Streaming Ingestion Pipeline- Bronze Layer

Get Vendor Data

Get Store data

Get IoT Sensor data

Transform

On Success

Pipeline Failure
A pipeline failure happens when a data pipeline cannot process, transfer, or load data as expected.

- **Failure attempt:** Max 3 times
- **Attempt time:** After 1 hour

Conclusion

The Sky Mart Express cloud system simplifies operations and improves efficiency by using Azure services for managing data. It processes data in real-time and in batches, ensuring accurate tracking of inventory and resources. The system provides easy-to-use dashboards and insights to help make better decisions. It also has safeguards to handle failures, making it reliable and effective for delivering a smooth customer experience.