

# Tahoe – Data Lake and Demand Forecasting



## **Executive Summary**



#### **BUSINESS NEEDS**

A Modern Data Platform with a modular. flexible and secure data lake which consolidates multiple data silos to equip the user to forecast demand to take informed decisions on the stocking levels in the store at a product level to keep in alignment with the business and growth needs which ends stagnated inventory and over purchasing. Using Predictive Models, the stores can set appropriate inventory management plans which will optimize future replenishment and customer demand, while realigning inventory with sales growth

A modern data platform in Azure, which ingests the data from heterogeneous sources, prepare, process and persist the data for,

- **Business Insights**
- Inventory Optimization Ο
- **Downstream Consumptions**

#### FEATURES

Data IngestionDIngest the datafrom RDBMS, Flatfiles, Json files,APIsfc	Data Preparation & Processing Parse, curate and process the data for different consumptions	Data Storage Store data at different levels of data processing - Raw, Prepared data, Processed data	Orchestration Automate and Orchestrate the end-end pipelines	Data Consumption Consume the data for Visualization, Downstream applications, Predictive models	<b>CI/CD</b> Automate the deployment with CI/CD pipelines
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#### **BENEFITS**

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Versatile services available for varying needs of data management to solve the different business use cases and leverages elasticity and automation

Optimize Inventory for visibility on stocks for better planning at a SKU level taking a 360-degree approach for accurate forecasted numbers

Minimal effort required in maintenance of solution Cost advantage

on scale and pay-

as-you-go service

Advanced visualization tool for integrated dashboards in client portal

## **Solution**



Source Systems - Order Management System - Cost Savings Application - PeopleSoft - Solutions System	<ul> <li>Ingestion</li> <li>Data Factory to ingest the data from On-Prem SQL Server, CSV &amp; json files from SFTP location into Azure Data Lake raw storage</li> <li>Kafka to ingest the real-time transaction events into Azure Data Lake raw storage</li> </ul>	<ul> <li>Storage</li> <li>Azure Data Lake to store the raw and curated data, with appropriate partitions and file formats</li> <li>Azure Synapse stores the processed and aggregated data</li> </ul>	Data Preparation - Databricks prepares the data with necessary curation and persist the data as conformed datasets into Azure Data Lake
Azure Synapse processes the curated data with necessary aggregations and business logics and persists the data for consumption - Azure Logic Apps for notification		<ul> <li>Data Consumption</li> <li>Predictive Models</li> <li>Models built and hosted in Databricks and outputs consumed by the web application</li> <li>Visualization</li> <li>Azure Analysis Services for Tabular model built on top of Synapse</li> <li>Power BI for Visualization and Reporting</li> </ul>	<b>CI/CD</b> - Azure Repos as code repository along with Azure DevOps services helps for Continuous Integration and Deployment

### **Architecture Variations**



,  1	Solution	Description
	Real Time Dashboards	Get insights in real-time using Power BI real-time Dashboards Azure Stream Analytics Job will process the streaming data and feed to Power BI real-time datasets for visualization
	Real Time Analytics	<ul> <li>Process the live streaming data from IoT devices, website click streams, applications in real-time</li> <li>Ingestion options <ul> <li>HDInsight Kafka, IoT Hub, Event Hub, API Management</li> </ul> </li> <li>Stream Processing options <ul> <li>Stream Analytics Job, Azure Databricks</li> </ul> </li> </ul>
	Advanced Analytics	<ul> <li>Consume the data insights from real-time web and mobile apps using Cosmos DB</li> <li>Derive deeper insights using machine learning / statistical techniques with Azure Databricks</li> </ul>

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Happiest

the first global firm to

India | United States | United Kingdom | Canada | Australia | Dubai

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