Bi-cycle Industry Data Exchange Application (IDX)
Smart E-tailing

Data-Core with Smart E-tailing in 2015

- A data sharing exchange for the bicycle industry that provides real-time business intelligence (BI) and facilitates collaborative applications.
- Serve organizations committed to the bicycle industry and the array of user requirements within each organization. (Suppliers, Brands, Retailers, POS Firms, etc.)
- Provide the total sales figures for all the US stores for specific products & Validate the formula used by SE to derive sales figures from inventory data & find its accuracy

Key Features

❑ Statistical Modeling:
a. Statistical Analysis using Demographic Data (Cluster Analysis)
b. Statistical Analysis using Inventory Data (Partitioning of data, Regression Analysis)
c. Statistical Analysis using Sales Figure (Partitioning of data, Regression Analysis)

❑ Build IDX development environment
a. Hadoop & associated ETL connectors
b. SQL Server
c. Data warehousing environment
d. Dundas BI integration
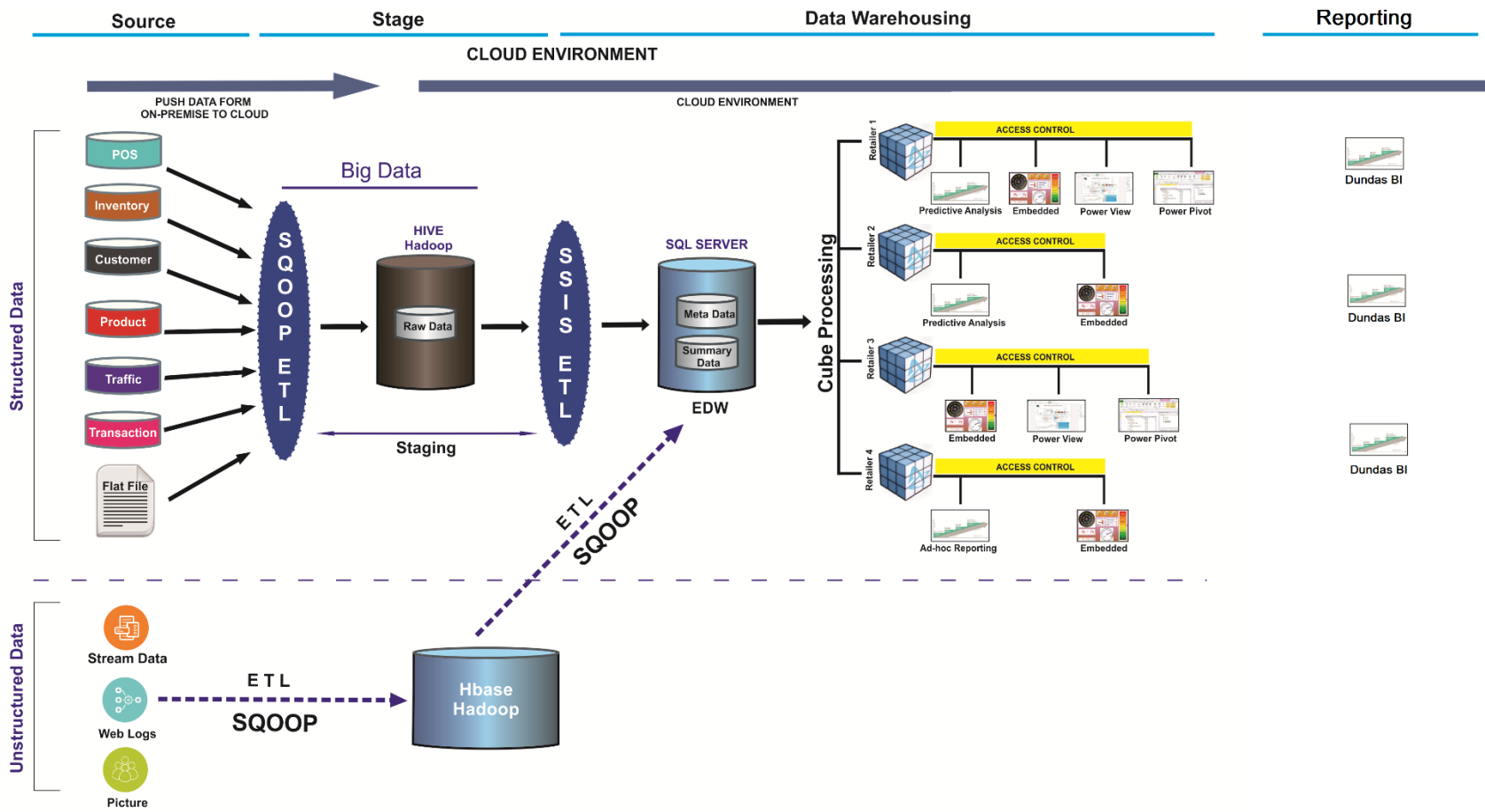
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The entities subscribing to IDX are categorized into three groups: Retailer, Brand and Supply Retailer.
The raw data is defined in IDX and prepared for visualization in Dundas BI in the below given phases:
a. Retail Inventory
b. Retail Sales
c. Supplier Market Share
d. Gross Margin & Pricing

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Industry Data Exchange Application (IDX)

Architecture Diagram Then (2015) …

Conversion of existing Architecture into new Architecture for Data-Core Smart E-tailing – Industry Data Exchange (DCS-SE-IDX)

Journey to 2019 – Conversion to handle data smart & efficiently with latest technologies

Key Features

- ❑ Data Ingestion to Azure Data Lake Storage through ADF from different On-Premises data sources like CSV, TXT, XML and from any Online Storage
- ❑ Data Wrangling using Azure Data Factory/U-SQL
- ❑ Data Cleaning, Transformation of data & Prep Data in Azure Data Factory as per business requirement
- ❑ Continuous syncing process using job schedulers in ADF
- ❑ Prepared Data Warehouse schema (Star/Snowflake) from ADL into Azure SQL DB / Azure SQL Data Warehouse through ADF
- ❑ Use Tabular Model for Azure Analysis Services for reporting
- ❑ Interactive Dashboards, KPIs Maps displayed in MS Power BI for visualization
- ❑ Extrapolated Demographic & Sales Data for Prediction in Sales

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At a mouse click, glance through decision making KPIs –

- ❑ WTD and MTD Gross Margin
- ❑ Turns & GMROI with 13m Trailing
- ❑ Industry Average
- ❑ Goal
- ❑ Missed Same Day Opportunities whether for Consumer Experiences or Potential Sales on Heat map
- ❑ Compare Sales YoY
- ❑ Distressed Inventory for Retailer/Brand/Supplier
- ❑ Sales Team Matrices
- ❑ Sales Prediction

Data-Core Smart E-tailing
Industry Data Exchange Application (DCS-SE-IDX)

Architecture Diagram Now (2019) ...
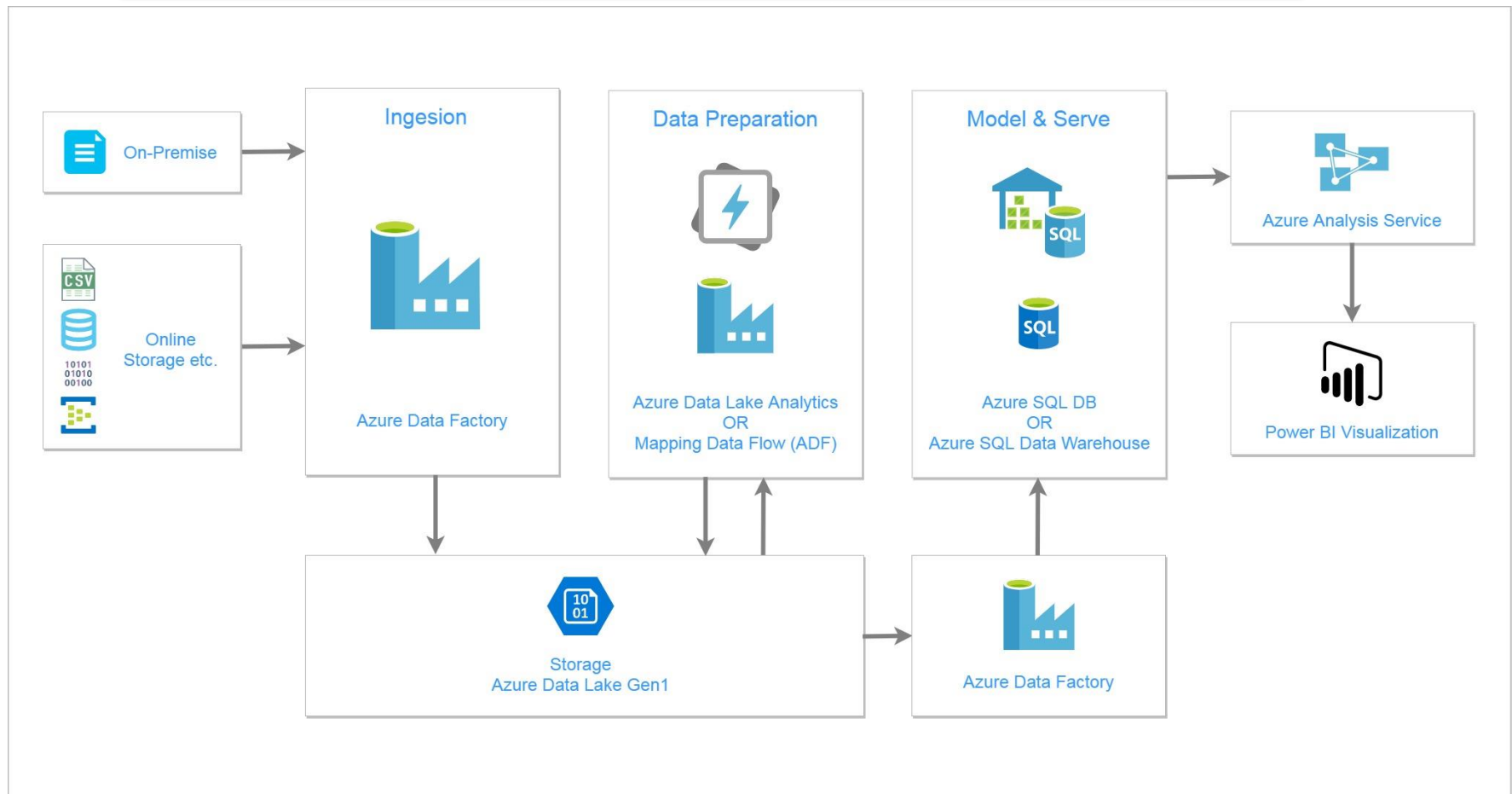
DCS-SE-IDX - Statistical Model & Regression Analysis

Smart E-tailing Statistical and Regression analysis consist of the following two steps to incorporate machine learning:
• Take the inventory data of the stores of different bicycle industries and then extrapolate the data with US census demographic data to create an extrapolated dataset for the units sold.
• Take that extrapolated dataset as an input and then prepare the dataset for various regression models to predict future unit sells.

Key Features

❑ Statistical & Regression Modeling:
a. Prepare the Extrapolated Inventory Data from Demographic Data in SQL server
b. Regression Modeling and Analysis using the Extrapolated Data - Partitioning of data, Grouping of data, Feature selection, Regression Analysis.

❑ Build DCS-SE-IDX ML analysis environment
a. SQL Server
b. Predictive Analysis using Python Programming
c. Machine Learning using Azure Machine Learning Studio and Azure Auto ML

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The complete extrapolated data will be taken as a raw input with multiple features of store, inventory, sales, demographic data.
The raw data is analyzed and model is trained using Regression Analysis with influencing features and Unit Sold as the target variable to predict Sales for the stores..