Tiger Analytics

Demand Forecasting Solution : 10 Weeks Implementation

www.tigeranalytics.com

Retail & CPG: Demand Forecasting & Profitability

Retail and CPG Industry are facing a perfect storm driven by a rapid growth of digital business models, changing consumer preferences, new sources of competition and supply chain uncertainties. This has resulted in a need to advance planning capabilities across dimensions, and it will be driven by **reliable demand forecasts.**

CHALLENGES

Due to increased SKUs and multi channel presence, the forecast errors lead to higher inventory costs and outstanding demand

IDEAL SOLUTION

The forecasting solution implemented for our clients evaluate statistical models at every node of the product hierarchy which leads to better planning

DESIRED OUTCOMES

Highly reliable models to drive superior forecasts and planning of inventory, sales, and revenue for the client organization

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WHAT ARE THE PROBLEMS...

LOW FORECASTING ACCURACY

- Demand volatility
- External shocks
- Lack of granularity
- Inflexibility
- Black box modelling
- Inability to scale

IDENTIFYING EMERGING OPPORTUNITIES

HOW WE DO SOLVE...

PROCESS

- Key driver identification and impact on sales
- Build models for predicting sales utilizing internal and external data
- Leveraging a portfolio of algorithms

LEVERAGING AZURE

- Data Aggregation: **Azure Data Lake Storage**
- Data Processing & Model Building: **Azure Data Bricks**
- Deployment: **Azure ML**
- Data Visualization: **PowerBI**

WHAT IT MEANS TO OUR CLIENTS...

REVENUE PREDICTION:

$3 Million profitability improvement insights generated for a global food manufacturer

EMERGING OPPORTUNITIES:

Identified business opportunity of $228 Million across 3 product categories for a large F&B firm

REPLENISHMENT SOLUTION:

Improve forecast accuracy and reduce inventory costs by **$15** million for a large retail firm

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Data Ingestion & Processing
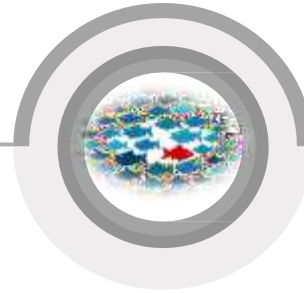
Spark for Time Series Processing
- Delta Lake for CDC and data versioning
- Efficient data access layout using partitioned parquet data sets on **ADLS (Azure)**

Outlier Identification

Identify events and promos and label them
- Hampel Filter, Percentile Approach

Time Series Exploration

Sparsity, Active vs Inactive, Trend identification
- Variable Interaction and Impact Analysis

Algorithm Portfolio

Causal Models
- Exception identification & reporting, Model Tuning
- Hyperparameter Tuning
- Model Evaluation Dashboard

Deployment & Monitoring

Forecast pipeline on Databricks
- Model Workflow Management for model tracking and management
- **Azure Data factory** for pipeline orchestration
- Easy Integration
- Results visualization via **PowerBI**

Tiger Analytics: Forecasting Solution using Azure Platform

The built forecast approach is to be scaled across the categories and markets seamlessly and in a less time-consuming manner. The Azure platform plays a significant role in enabling the scalability and multi source ingestion of data sets. The solution when deployed on Azure platform enables significant acceleration and ensures a time and effort savings (2x to 4x).
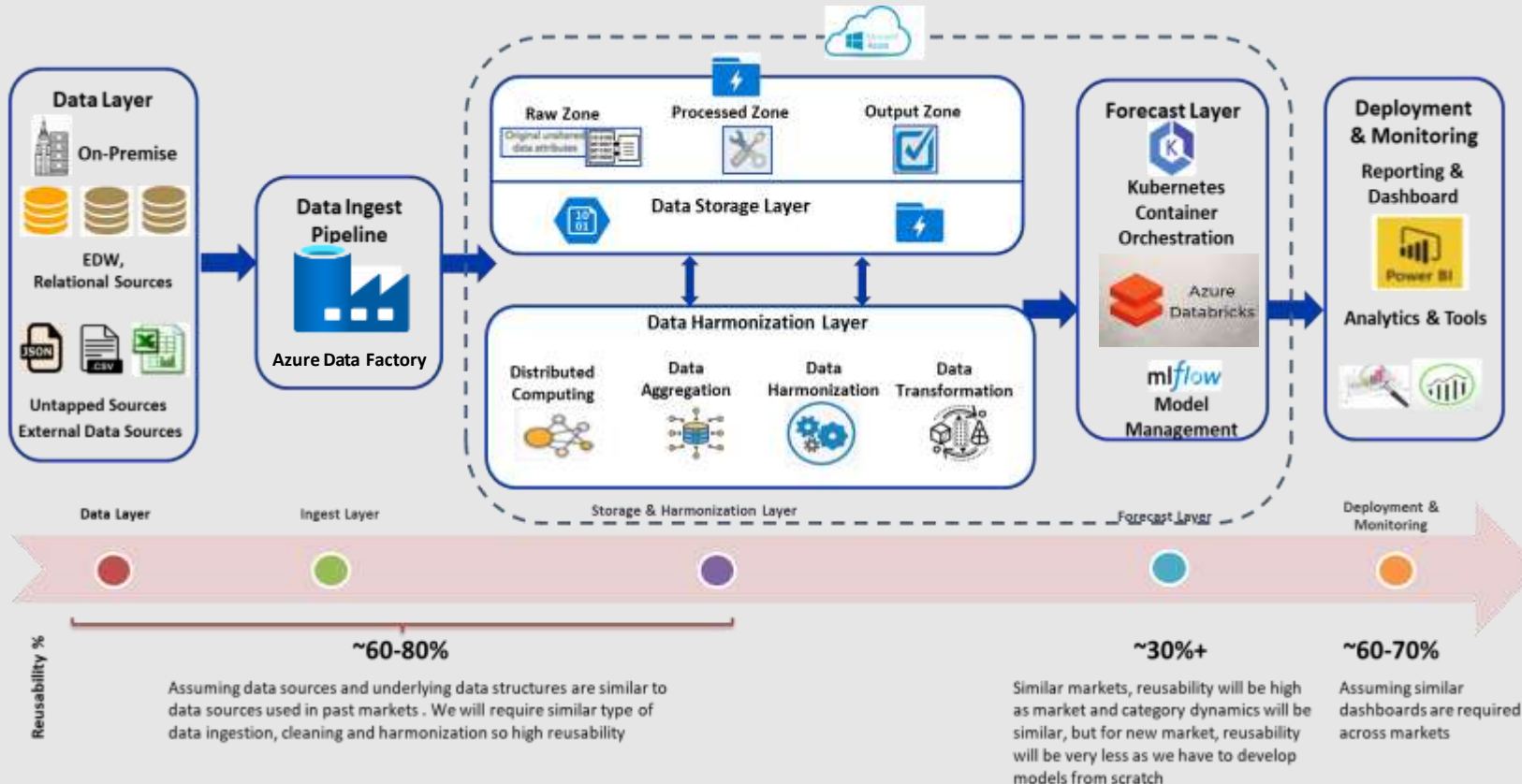
Azure Integration Benefits

Savings in effort:

60-80%   **Data Aggregation & Data Ingestion**

30%   **Data Processing & Forecasting**

60-70%   **Developing Dashboards**

Tiger Analytics Delivery Approach (Illustrative)

Weeks 1 to 2	Weeks 3 to 4	Weeks 5 to 8	Weeks 9 to 10*

Sample Action Steps

Weeks 1 to 2
- Understand key business objectives and challenges
- Identify internal and external data sources for analysis and modeling
- Determine key drivers
- Develop hypotheses to feed into feature creation and model building

Weeks 3 to 4
- Perform data quality checks and transformations
  - Missing value imputation
  - Outlier / invalid treatment
- Conduct exploratory analysis on the data
- Perform feature engineering to create IDVs

Weeks 5 to 8
- Model development
- Capture relative importance of key drivers
- Score validation datasets to evaluate model performance
  - Out-of-sample
  - Out-of-time
- Fine-tune models as required
- Define success criteria

Weeks 9 to 10*
- Consolidate and deploy prediction engine at micro-segment level to provide demand forecast

Sample Deliverables

Weeks 1 to 2
- Harmonized internal data and external data
- Finalized requirements and approach documents

Weeks 3 to 4
- Finalized modeling dataset
- Exploratory data analysis results

Weeks 5 to 8
- Model assessment for prediction accuracy
- Model performance summary

Weeks 9 to 10*
- Output structure determination
- Model documentation and knowledge transfer

*Estimate will depend on the complexity of the use-case (MVP) and data sources

Accelerate your demand forecasting process with Tiger Analytics to drive profitability

Get an assessment for your customers

Call for more information: + (480) 648-3762

Ask a question via email: partnership@tigeranalytics.com

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