



Modern Finance Solution Accelerator

POWERED BY:  **EARLY ACCESS** ENGINEERING

Growing pressures on the finance function

Market changes increase need for data insights that drive financial decisions

Derive value from financial data

86% of finance organizations fail to harness large volumes of data to deliver valuable business insights.¹



Respond quickly to market disruptions

89% of manufacturers said COVID-19 caused a drop in sales, increased cost of materials, extended production times, and delayed launches.²



DATA

Use advanced analytics to identify levers for growth

82% of CFOs said advanced data analytics were a top priority for investment, but nearly as many said the goal will be difficult to achieve.³



Manage risk with speed and accuracy

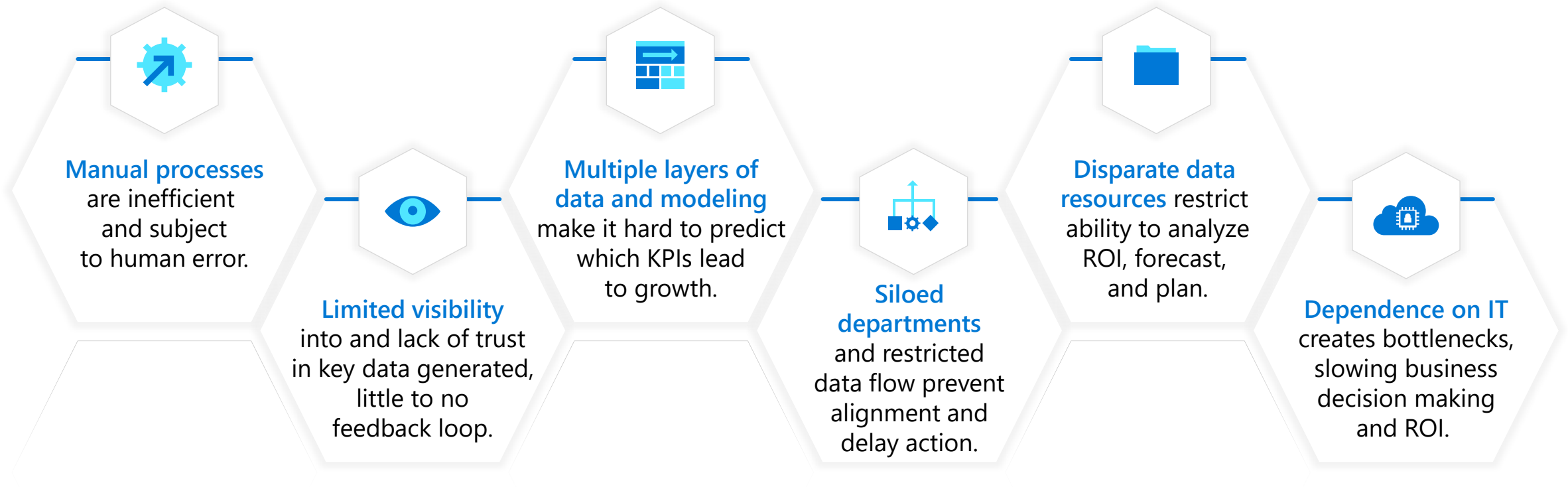
46% of companies are spending more time focusing on risk management in their finance functional areas.⁴



1. [The Future of Analytics in the Finance Function](#)
2. [2020 State Of Manufacturing](#)

3. [Gartner CFO Survey Reveals A Dramatic Digital Acceleration Since COVID-19](#)
4. [The impact of COVID-19 on the finance function](#)

Challenges to making data-driven business decisions



Gain financial insights that drive growth



Automate data and analytics processes for increased efficiency



Generate transparent and trustworthy data and analytics.



Gain insights with increasing accuracy through machine learning.



Increase time to decisions and ROI by removing IT bottlenecks.

Transform the way you make finance decisions

Use machine learning and business intelligence for increasingly accurate business predictions



Increase efficiency by bringing together business and technical strategies.



Align data from multiple data streams directly to business ROI.



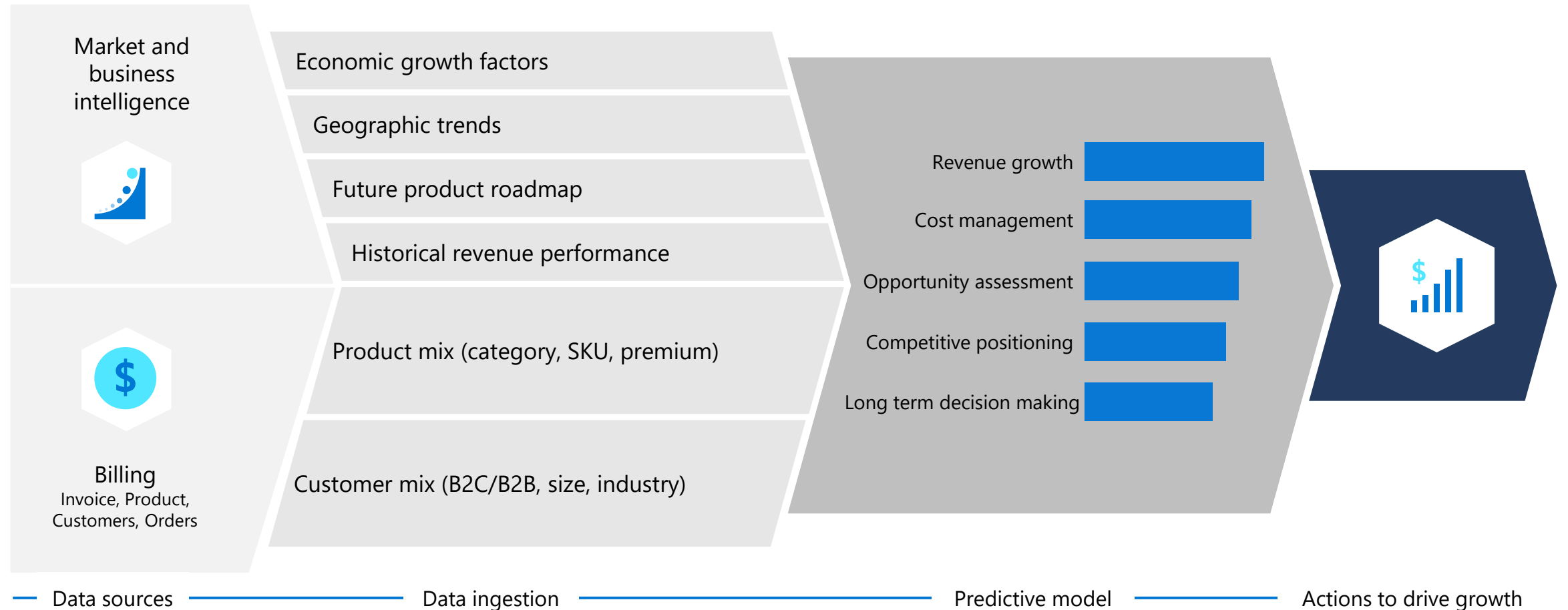
Tie cost and customer inputs together for more meaningful supply chain planning.



Create a dynamic picture of data across the enterprise to gain critical insights on growth and opportunity.

A model for predicting high-growth activities and trends

Unify and automate data for predictive modeling with Azure Synapse Analytics and machine learning



Bayer's success



The Power BI dashboard is a game-changer for us. It enables self-service for our CFO for overseeing the business, and to present financials in real time to stakeholders, such as the board.



MATTHIAS EISENACK

Portfolio Manager



[Read full story here](#)

SITUATION

Bayer's CFO needed a central location to access critical data and insights to **inform present and future financial decisions** and improve overall efficiency and effectiveness.

SOLUTION

Bayer used **Power BI** to create a one-stop shop for self-serve financial data called the CFO App. The app includes a **dashboard that summarizes the business's 13 most relevant KPIs on a single screen.**

IMPACT

The simple, easy-to-read solution provides the CFO and finance professionals with a **single source of truth**. As a result, Bayer has experienced significant **time savings and more effective and informed discussions and decision-making.**

Chipotle's success



To track key performance indicators such as repeat visitors or customer sentiment, we need to be able to gather and analyze longitudinal data in a more effective way.



SASHI KOMMINENI

Director of Enterprise Analytics



[Read full story here](#)

SITUATION

Chipotle needed to **better understand guests** in brick and mortar and online channels and be able to activate insights to **drive appropriate personalized offers and ads** across multiple destinations, including Facebook.

SOLUTION

Chipotle used Azure Machine Learning to **unify customer profiles** and **integrate multiple data sources** with digital advertising channels.

IMPACT

Chipotle has been able to **enrich customer profiles** with demographics and preference across multiple information platforms and then use those **new insights** to drive a personalized digital advertising experience for known and unknown customers, **grow digital orders**, and **increase customer loyalty**.

Lumen's success



The data is there to tell the story. With Azure Synapse Analytics, we can utilize functionality and really begin to drive improvements.

LUMEN[®]

TAMMY NYMAN
Vice President Shared Services



[Read full story here](#)

SITUATION

Lumen's key challenge was workflow: **data was hitting roadblocks and bottlenecks**. Inefficiencies and redundancies slowed work orders. Service lagged, leading to decreased conversion rates and lower customer satisfaction. Something needed to change.

SOLUTION

The company custom-built an Azure Synapse Analytics-based platform that pulls **different data sources into a single dashboard** for stakeholders across the organization.

IMPACT


Processes that used to be manual and cumbersome became **nimble and automated**. The new solution unites Lumen under a single, **customer-focused culture** and is empowering new approaches to **predictive modeling**.

Next steps: Accelerate your journey




Kick-off

Learn more about the Modern Finance Solution Accelerator and see a demo



Proof of value

Optional solution code walk-through and prototype creation based on sample data for testing.



MVP and deployment

Minimum Viable Product (MVP) or Proof of Concept (POC) is built based on your data with support of technical specialists and Partners.



30 minutes

1-3 days

2-5 weeks

Deliver powerful financial insights to inform actions for growth

Machine learning and business intelligence for increasingly accurate business predictions



Easily launch using pre-built code from GitHub for quicker time to value.



Creates a **single pane of glass** that unifies your data in one secure place.



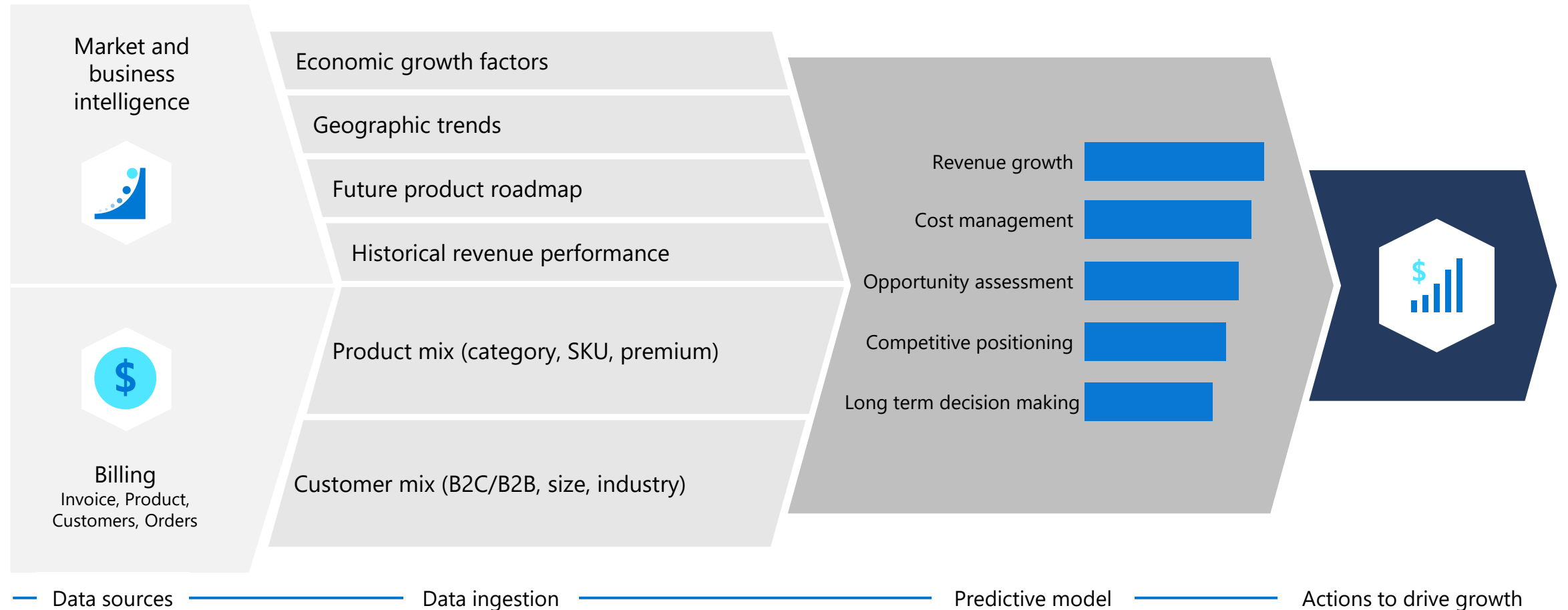
Reduce project time with unified, automated, end-to-end analytics.



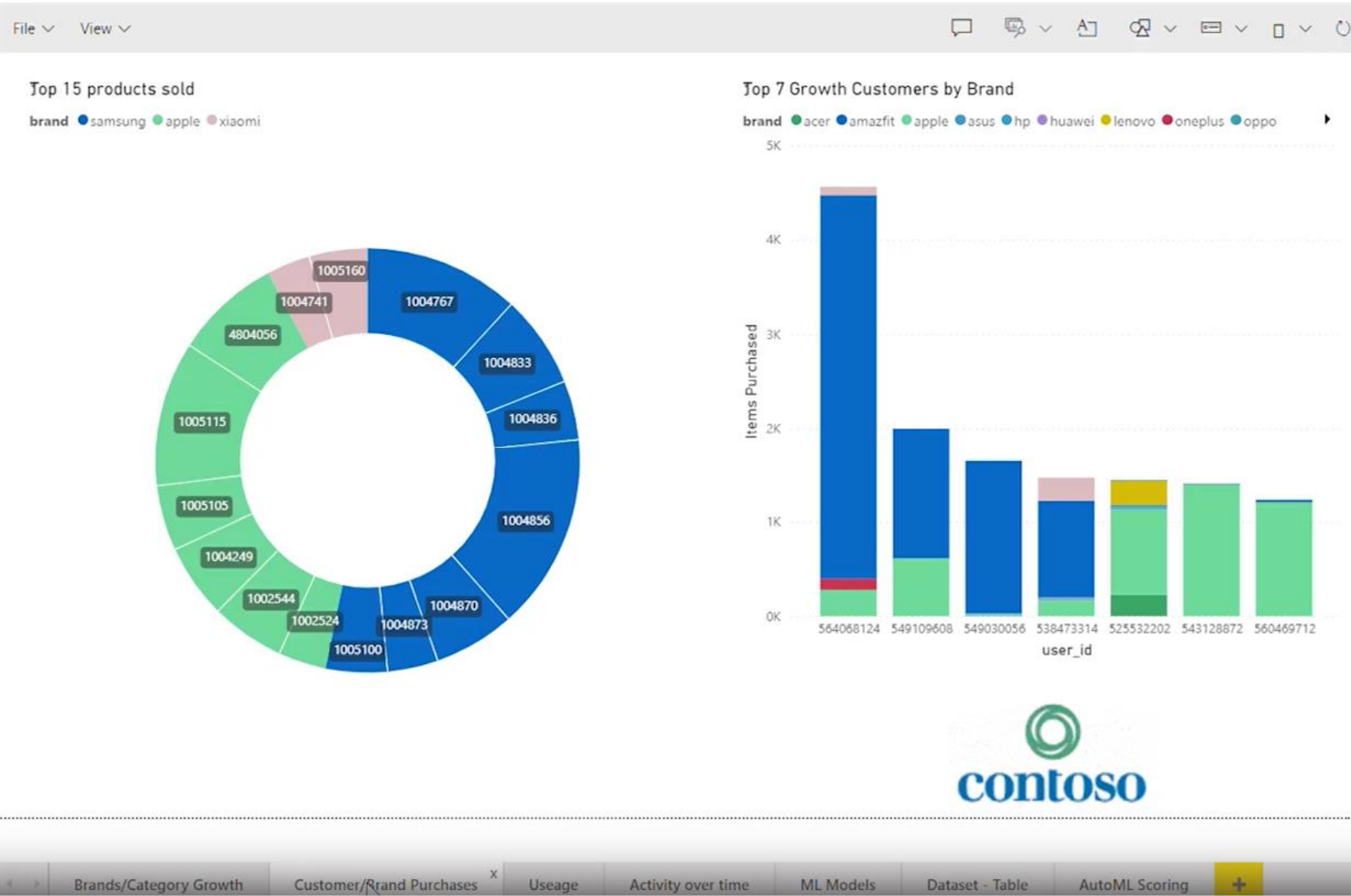
Predictive modeling enables learning over time for greater insights.

A model for predicting high-growth activities and trends

Unify and automate data for predictive modeling with Azure Synapse Analytics and machine learning

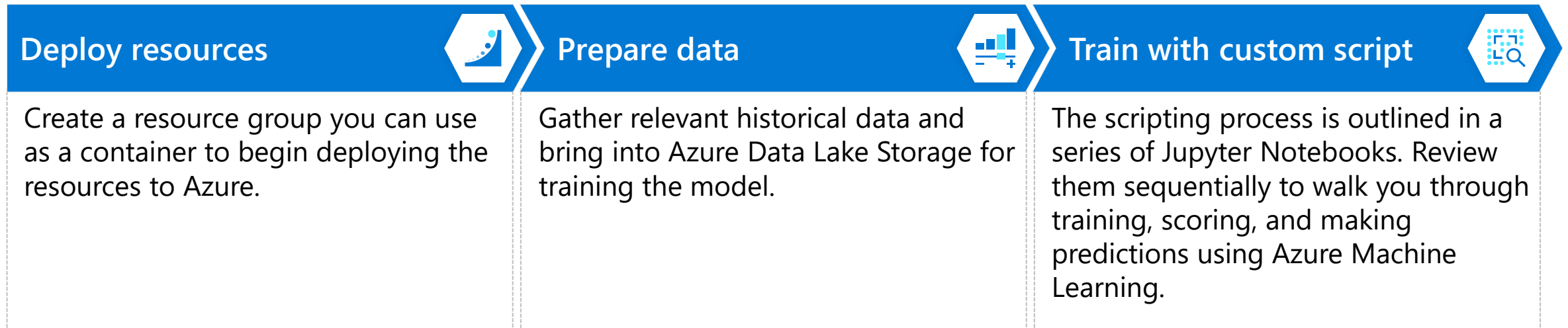


Power BI



Next steps in your personalized MVP deployment

To begin creation of your MVP, follow these steps:



With demo data, create your optional POV in 1-3 days

With your custom data and a prep session, create your MVP or POC in 2-5 weeks

Thank You





Synapse Analytics
Workspace

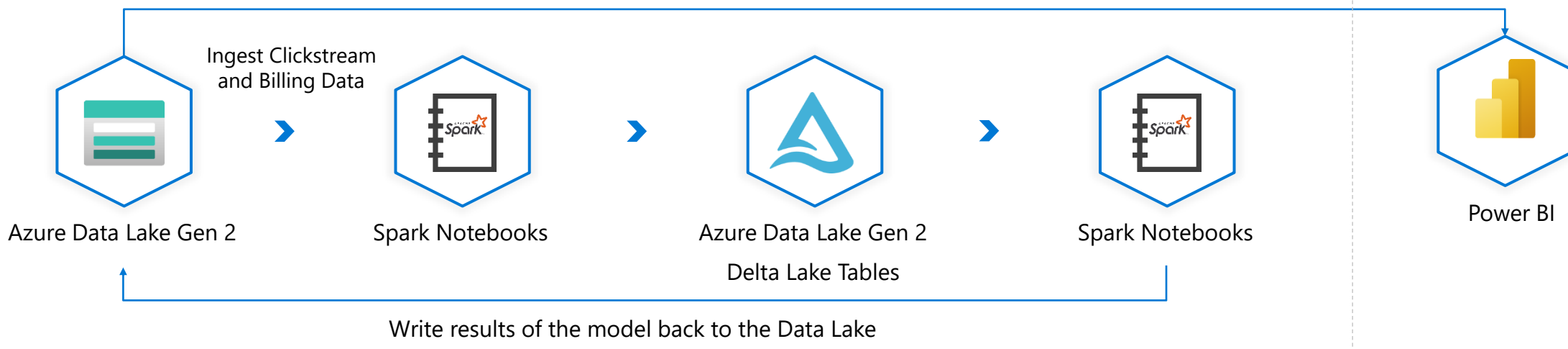
Synapse AI Architecture

Import clickstream, billing and model results into Power BI data model

Exploratory Data Analysis
Data Transformation
Feature Engineering

Persist Transformed Data
to a Delta Lake Table in
Azure Data Lake Gen2

Build Spark Machine
Learning Model



Write results of the model back to the Data Lake

Orchestrate batch model runs (daily)

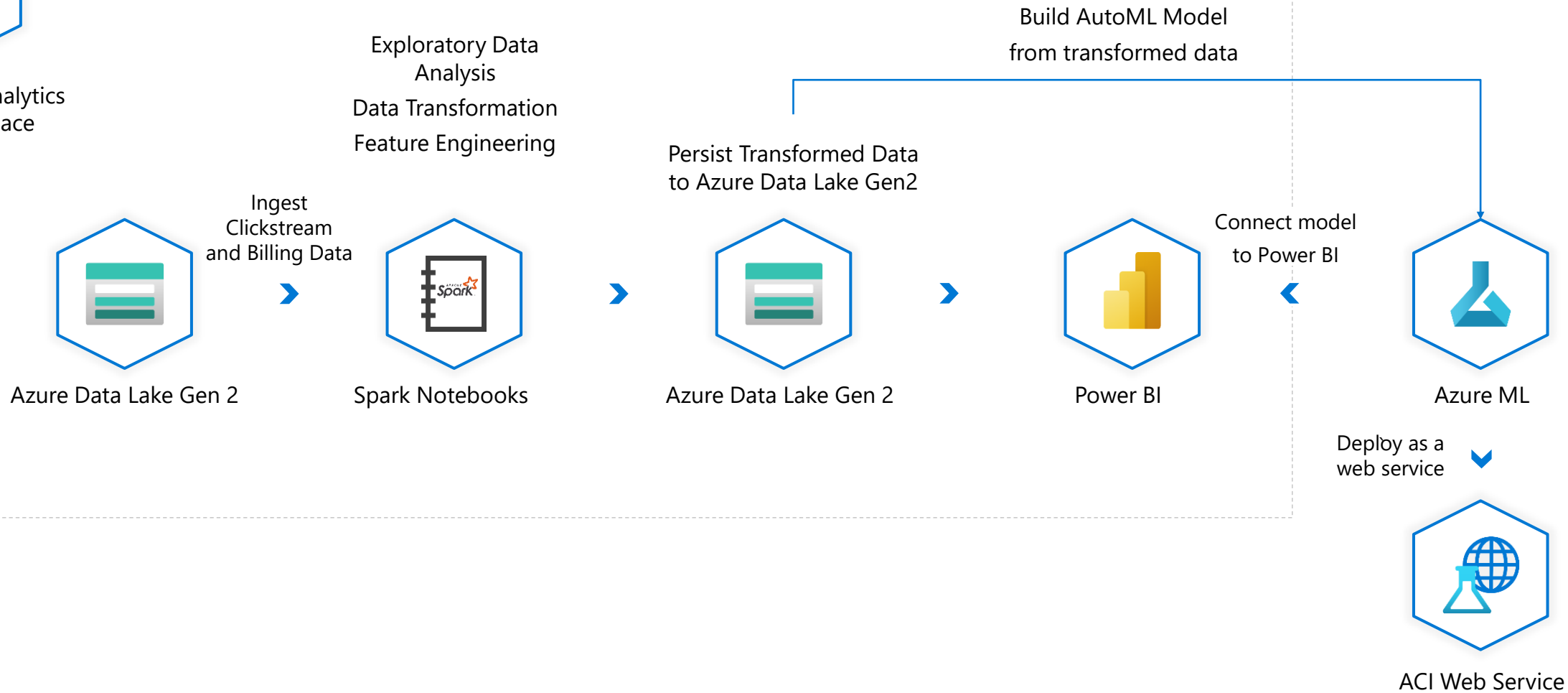


Pipelines



Synapse Analytics
Workspace

Synapse AI + Azure ML AutoML Architecture



Dataset

The screenshot displays the Microsoft Azure Data Studio interface. On the left, the 'Data' pane shows a tree view of resources, including 'Storage accounts', 'Databases', and 'Tables'. The 'retailaidb (Spark)' database is selected, and the 'cleaned_dataset' table is highlighted. In the center, a SQL script is shown in a notebook, which is a 'SELECT TOP (1000) [brand]' query. The script is highlighted with a red box. Below the script, the 'Results' pane shows a table of data, also highlighted with a red box. The table has columns: BRAND, CATEGORY_CODE, CATEGORY_ID, EVENT_TIME, EVENT_TYPE, PRICE, PRODUCT_ID, USER_ID, and USER_SESSION. The first row of data is highlighted.

```
1 SELECT TOP (1000) [brand]
2 ,[category_code]
3 ,[category_id]
4 ,[event_time]
5 ,[event_type]
6 ,[price]
7 ,[product_id]
8 ,[user_id]
9 ,[user_session]
10 FROM [retailaidb].[dbo].[cleaned_dataset]
```

BRAND	CATEGORY_CODE	CATEGORY_ID	EVENT_TIME	EVENT_TYPE	PRICE	PRODUCT_ID	USER_ID	USER_SESSION
samsung	appliances.kitchen.hob	2232732102745585991	2020-01-30 09:22:28 UTC	cart	314.23	4500659	603264523	39e376e1-f7d3-4...
artel	appliances.kitchen.washer	2232732092297380188	2020-01-30 09:22:29 UTC	view	141.32	3601349	566757483	8b4fc82b-ef3e-4...
haier	appliances.kitchen.refrigerators	2232732091718566220	2020-01-30 09:22:29 UTC	view	1801.82	2702130	608071770	ba9176d1-a0e2-4...
moser	appliances.personal.hair_cutter	2232732089587859740	2020-01-30 09:22:30 UTC	view	40.77	8700099	567830828	603a88e-a70b-4...
dauscher	appliances.environment.vacuum	2053013565983425517	2020-01-30 09:22:30 UTC	view	43.24	3701288	537200484	678631b0-8c75-4...
birusa	appliances.kitchen.refrigerators	2232732091718566220	2020-01-30 09:22:30 UTC	view	202.42	2701430	570126330	0ba25201-c25e-4...
kifort	appliances.environment.vacuum	2232732101063475749	2020-01-30 09:22:30 UTC	view	41.16	3701178	579839122	a287e3e5-672e-4...
samsung	appliances.personal.massager	2232732099754852875	2020-01-30 09:22:30 UTC	view	562.43	1801929	524109686	6e4440c2-8410-4...
huawei	appliances.kitchen.refrigerators	2053013563835941749	2020-01-30 09:22:30 UTC	view	720.48	1004536	543188102	01288339-3616-4...
samsung	appliances.personal.massager	2232732099754852875	2020-01-30 09:22:31 UTC	purchase	630.00	1801849	605146282	9efed059-8eaf-4...
samsung	appliances.personal.massager	2232732099754852875	2020-01-30 09:22:31 UTC	view	299.85	1801739	608075926	4e00810d-d89d-4...
alparmedor	appliances.kitchen.mixer	2053013563835941749	2020-01-30 09:22:31 UTC	view	636.77	1400016	431334031	4e13b47d6-7d4e-4...

Dataset is from Kaggle ([link](#))

Raw dataset needs to be cleaned (clean up of NULL rows or items that are long tail)

Model Development



Azure Synapse Analytics Spark

```
ML Model Building
+ Cell Run all Undo Publish Attach to growthfactors Language PySpark (Python)
14 'subcategory_audio_purchased_binary', 'subcategory_clocks_purchased_binary',
15 'subcategory_tablet_purchased_binary', 'subcategory_telephone_purchased_binary',
16 'product_id_1004856_purchased_binary', 'product_id_1004767_purchased_binary',
17 'product_id_1005115_purchased_binary', 'product_id_4804056_purchased_binary', 'product_id_1004833_purchased_binary']
18
19 numeric_cols = ['sessions_per_user_per_month', 'avg_session_duration_per_user_per_month', 'avg_conversion_rate_per_user_per_month',
20 'avg_order_value_per_user_per_month', 'avg_cart_abandon_rate']
21
22 stages = [] # stages in our Pipeline
23
24 # Category Indexing with StringIndexer - Use OneHotEncoder to convert categorical variables into binary SparseVectors
25 string_indexes = [StringIndexer(inputCol = c, outputCol = 'idx_' + c, handleInvalid = 'keep') for c in categorical_cols]
26 onehot_indexes = [OneHotEncoderEstimator(inputCols = ['idx_' + c], outputCols = ['ohe_' + c]) for c in categorical_cols]
27 stages += string_indexes + onehot_indexes
28
29 # Transform all numeric features into a vector using VectorAssembler
30 assembler_inputs = ['ohe_' + c for c in categorical_cols] + numeric_cols
31 assembler = VectorAssembler(inputCols = assembler_inputs, outputCol = 'features', handleInvalid = 'keep')
32 stages += [assembler]
33
34 # Create an indexed label from your target variable
35 label_string_idx = StringIndexer(inputCol = target_col, outputCol = 'label', handleInvalid = 'keep')
36 stages += [label_string_idx]
37
38 # Set a random seed variable for reproducibility
39 random_seed_val = 12345
40
41 # Light GBM Classifier
42 lgbm = LightGBMClassifier(learningRate = 0.1, numIterations = 100, numLeaves = 50)
43 stages += [lgbm]
44
45 lgbmPipeline = Pipeline(stages = stages)
46 lgbmPipelineModel = lgbmPipeline.fit(trainDF)
47 lgbmDF = lgbmPipelineModel.transform(testDF)
```

Binary classification model – using Microsoft MMLSpark’s LightGBM algorithm



Azure Machine Learning AutoML

Microsoft Azure Machine Learning

customergrowthfactors > Automated ML > customer_growth_classification > Run 344

Run 344 Completed

Refresh Cancel

Details Data guardrails Models Outputs + logs Child runs Snapshot

Deploy Download Explain model

Algorithm name	Explained	AUC weighted ↓	Sampling ⓘ
VotingEnsemble	View explanation	0.74460	100.00 %
StackEnsemble		0.74409	100.00 %
MinMaxScaler, LightGBM		0.74301	100.00 %
StandardScalerWrapper, XGBoostClassifier		0.74252	100.00 %
MaxAbsScaler, XGBoostClassifier		0.74228	100.00 %
StandardScalerWrapper, XGBoostClassifier		0.74166	100.00 %
StandardScalerWrapper, XGBoostClassifier		0.74165	100.00 %
MaxAbsScaler, LightGBM		0.74143	100.00 %
StandardScalerWrapper, LightGBM		0.74120	100.00 %
StandardScalerWrapper, XGBoostClassifier		0.74078	100.00 %
StandardScalerWrapper, XGBoostClassifier		0.73931	100.00 %

Models generated through Azure ML Studio UI to reduce barriers to ML insights