2018 Global Azure BOOTCAMP

Azure Machine Learning Services

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VALUEMOMENTUM
Deliver Value. Drive Momentum.℠

Corporate Overview – ValueMomentum Software Services

- Software & Services Firm
- **Financial Services & Insurance focused**
- Established in 2000 with HQ in NJ, USA
- 150+ dedicated R&D team
- Executive Leadership and Practice Heads based in the US
- Offshore centers are SSAE 16 SOC 2 certified. Clean Rooms for several clients offshore

23%
Compound Annual Growth Rate since 2000

4
Analysts covering ValueMomentum Software & Services

>65
Clients Served in North America

1,850+
Global employee strength

Top 15
IT Services Vendor for North American P&C Carriers by # of customers*

14
>5 Year Customer Relationships Average ~8 years

BUSINESS FOCUS

- Banking & Lending
- Capital Markets

- Property & Casualty
- Healthcare
- Life & Annuities

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Agenda

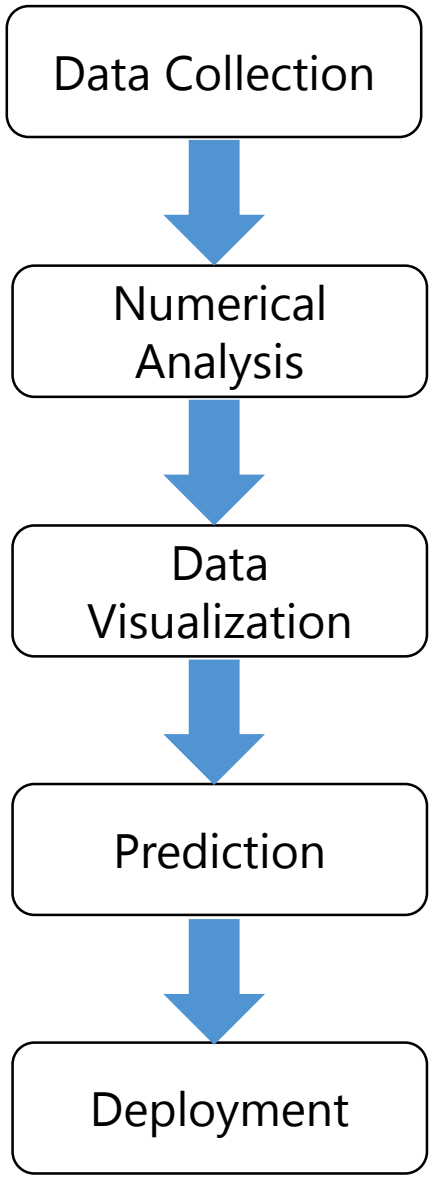
- Why Azure Machine Learning Service?
- What is Azure Machine Learning Service?
- Steps to Use Azure Machine Learning Service
- How/Where Azure Machine Learning Service can be used?
- Demo on Azure Machine Learning Service. Example: Titanic

Why Azure Machine Learning Service?

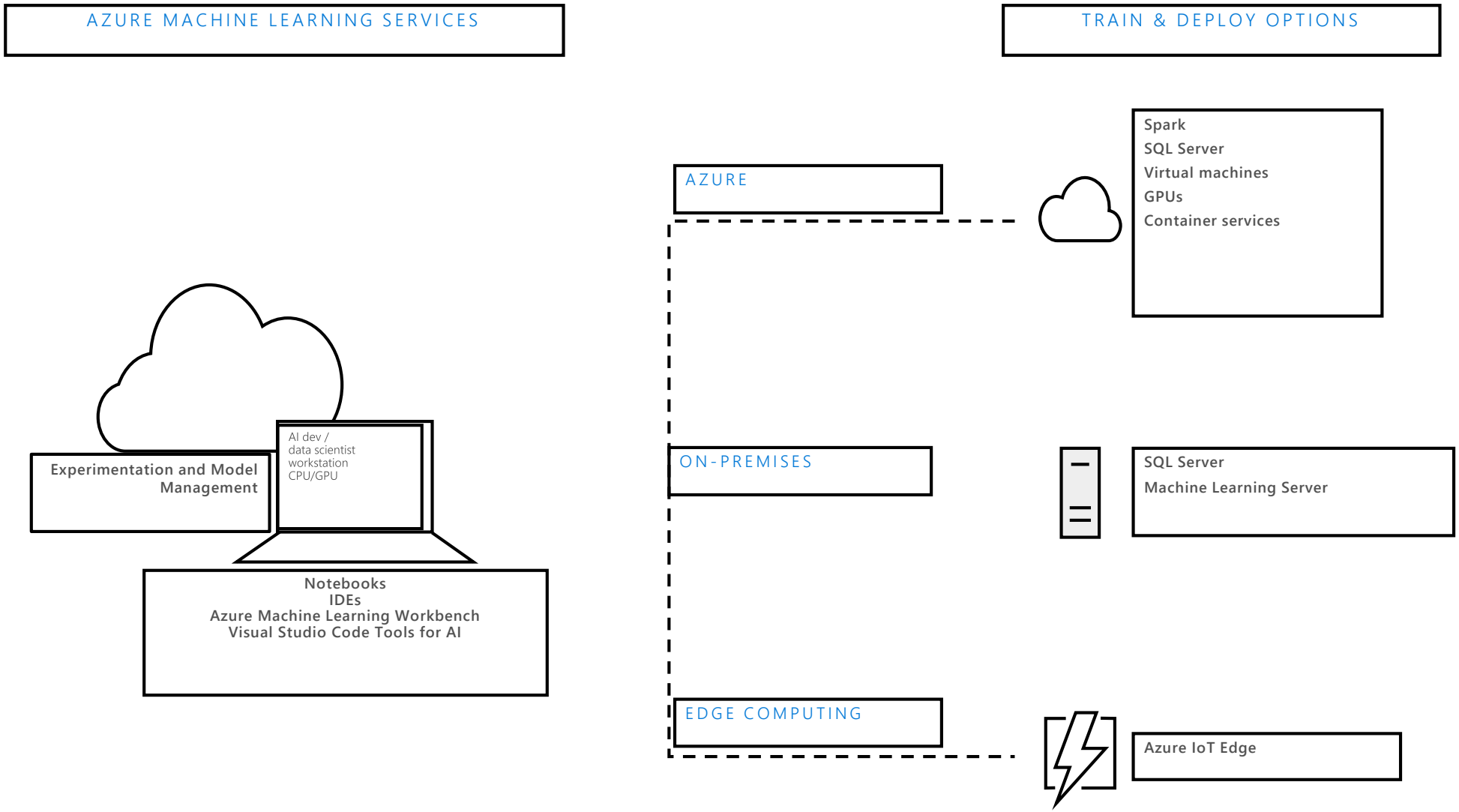
- Azure Machine Learning service (preview) is an integrated, end-to-end data science and advanced analytics solution for professional data scientists to prepare data, develop experiments, and deploy models at cloud scale.

- The main components of Azure Machine Learning are :
  - Azure Machine Learning Workbench
  - Azure Machine Learning Experimentation Service
  - Azure Machine Learning Model Management Service
  - Microsoft Machine Learning Libraries for Apache Spark (MMLSpark Library)
  - Visual Studio Code Tools for AI

Machine Learning : Step by Step Approach



Azure Machine Learning



Ref – Microsoft BRK3319 Increase the rate of Experimentation with Azure Machine Learning Service

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Machine Learning Steps

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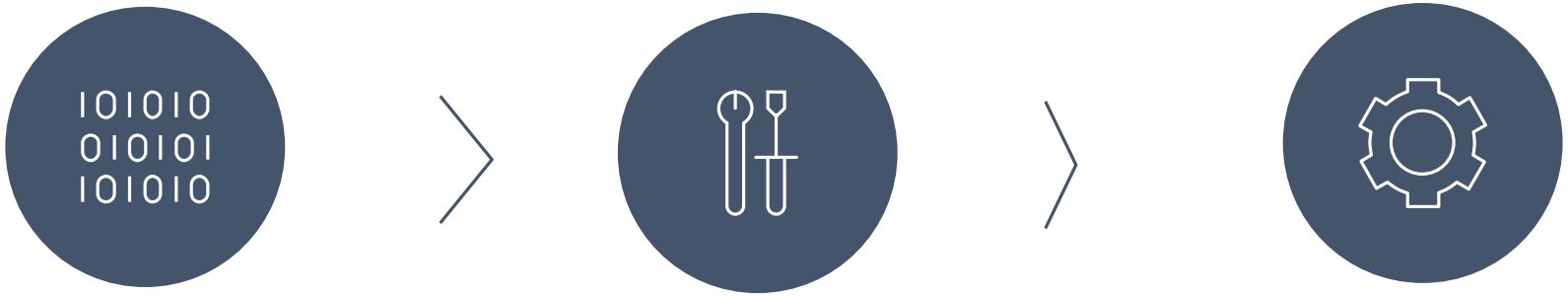


Prepare data

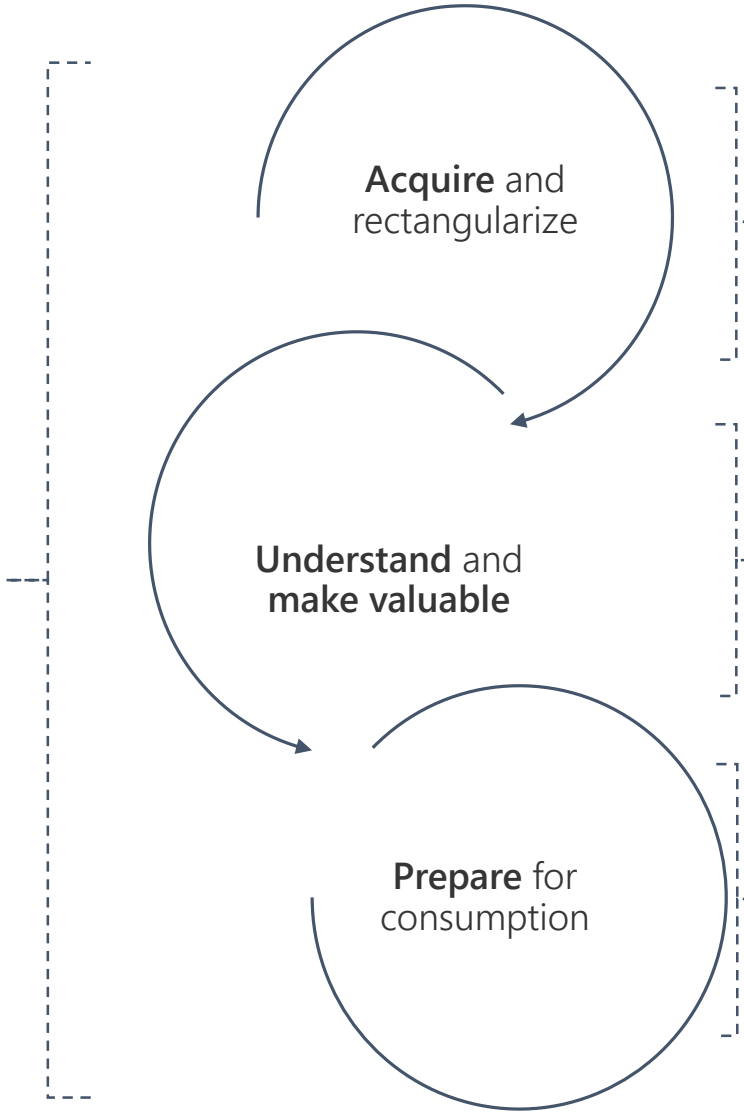
Build model

Operationalize

Agile Data Preparation Workflow

Enterprise data pipeline

- Schedule
- Deploy
- Scale Up/Out
- Secure
- Monitor
- Diagnose



Read heterogenous data
Sample
Flatten
Distill structure

Profile
Infer types and entities
Clean
Transform, extract, combine
Augment

Reshape
Aggregate
Featurize
Compare
Validate

Ingest and Sample

Data storage

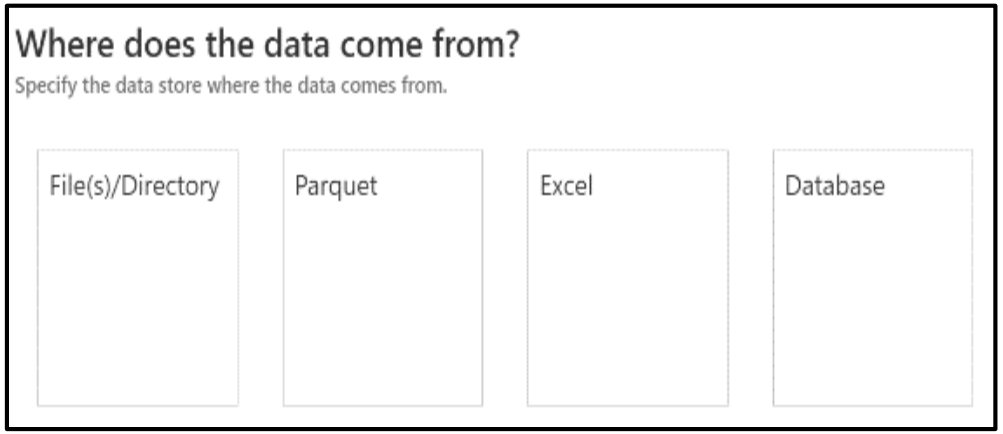
- ✓ File system
- ✓ Azure Blob
- ✓ SQL Database

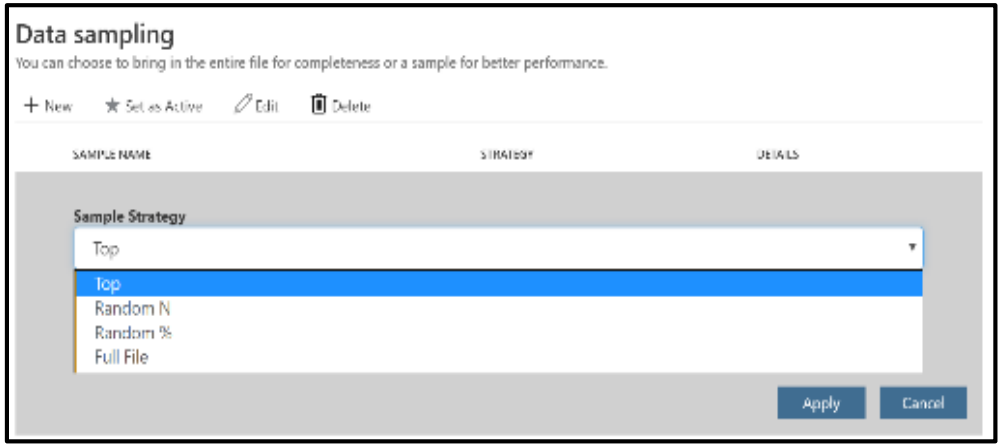
File Types

- ✓ Delimited Files (CSV, TSV, TXT)
- ✓ Fixed Width
- ✓ Plain Text
- ✓ Excel
- ✓ Parquet
- ✓ Json

Sampling Strategy

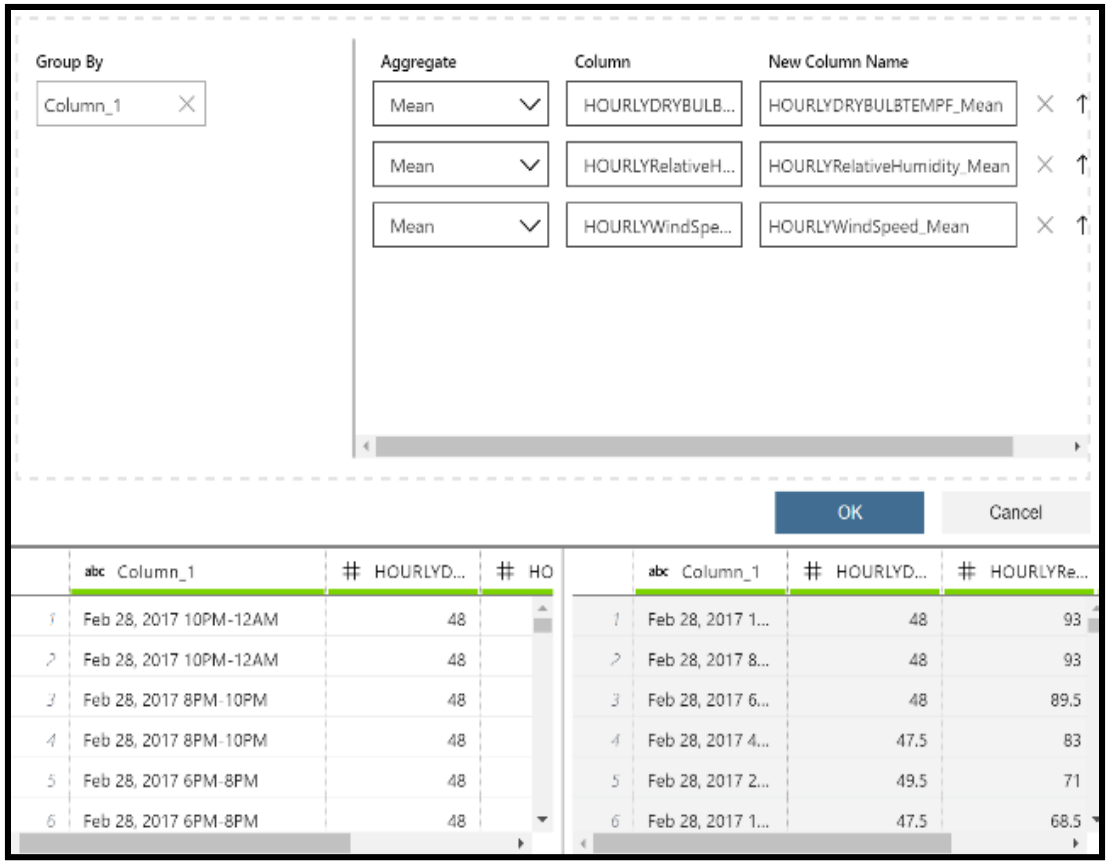
- ✓ Top N
- ✓ Random N
- ✓ Full file
- ✓ Random %





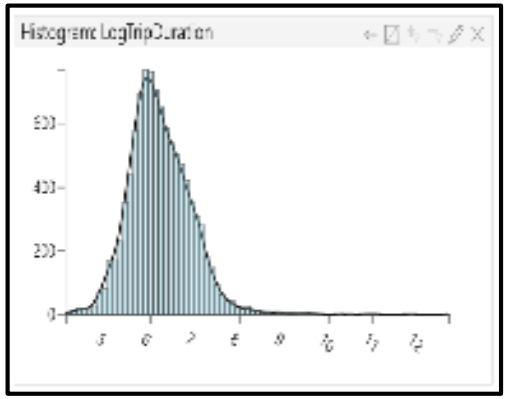
Other Transforms

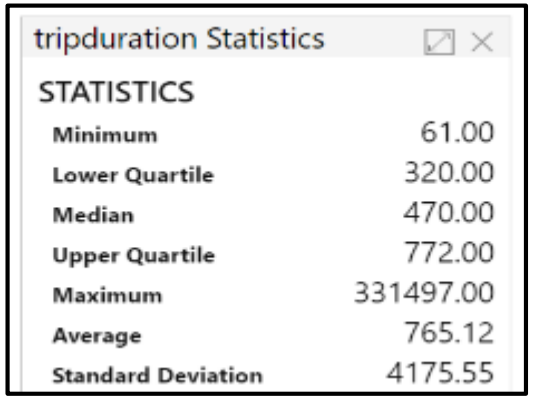
- Column (duplicate, remove, keep)
- Convert Field,
- Append (rows, columns)
- Remove (duplicate)
- Adjust Precision
- Clustering, Trim String
- Join
- Summarize

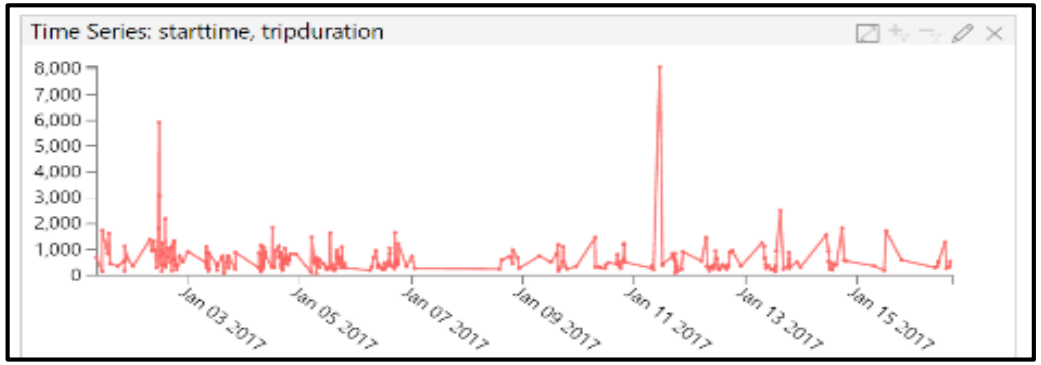


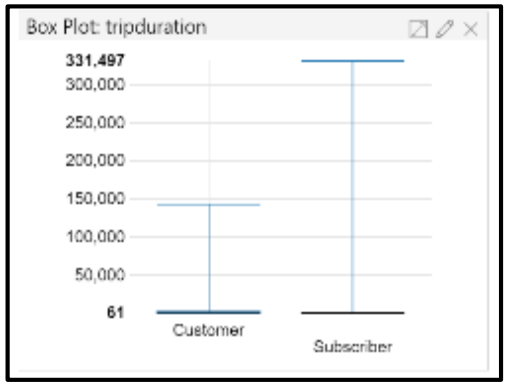
Inspectors

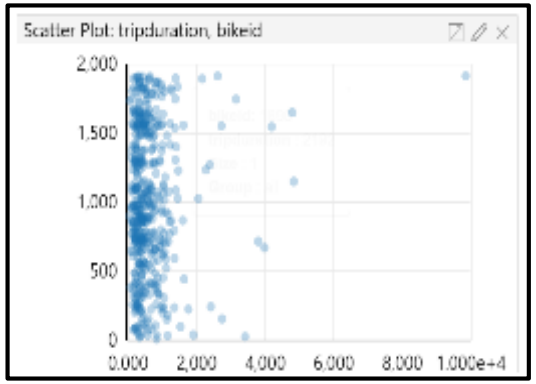
- Column statistics : Numeric
- Histogram
- Value Counts
- Box Plot
- Scatter Plot
- Time Series
- Map







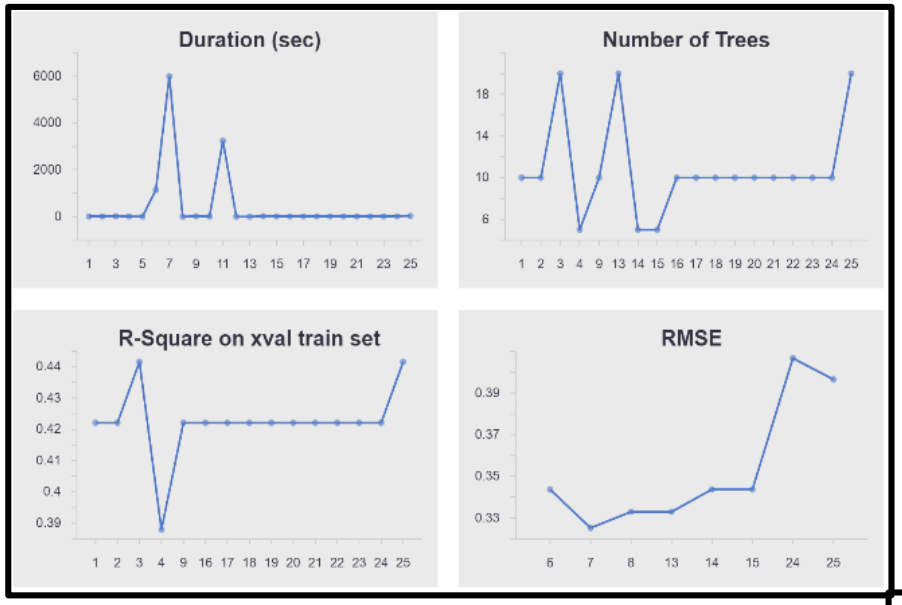




Run History and Metrics

- Azure Machine Learning tracks experiment using a “run history” service.
- Using Azureml_logger library allows to track evolution of metrics across runs.
- Can compare runs to one another.
- View panel can be customized.
- Job panel to track progress near real-time.

Run History and Metrics (Continued.)



Evaluation Metrics

Pattern to invoke Azure ML Logger to record metrics

```
# Import Azure ML Logger library
from azureml.logging import get_azureml_logger

# Create a new instance of the logger
run_logger = get_azureml_logger()

# log a value (associated to a given experiment and
project)
run_logger.log("key", value)

# log an array of values (associated to a given run)
run_logger.log("Actual",
[testlabel[i] for i in
range(len(testlabel))[0::100]])
```

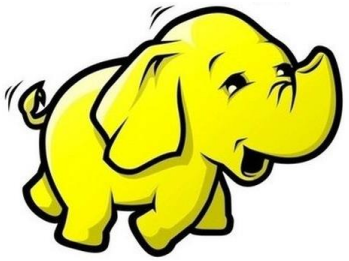
Command Line Interface (CLI)

- Most of Azure Machine Learning functionalities are available through the CLI.
- Empower both the IT Admin and the Data Scientist.
- Integrated with Azure CLI.

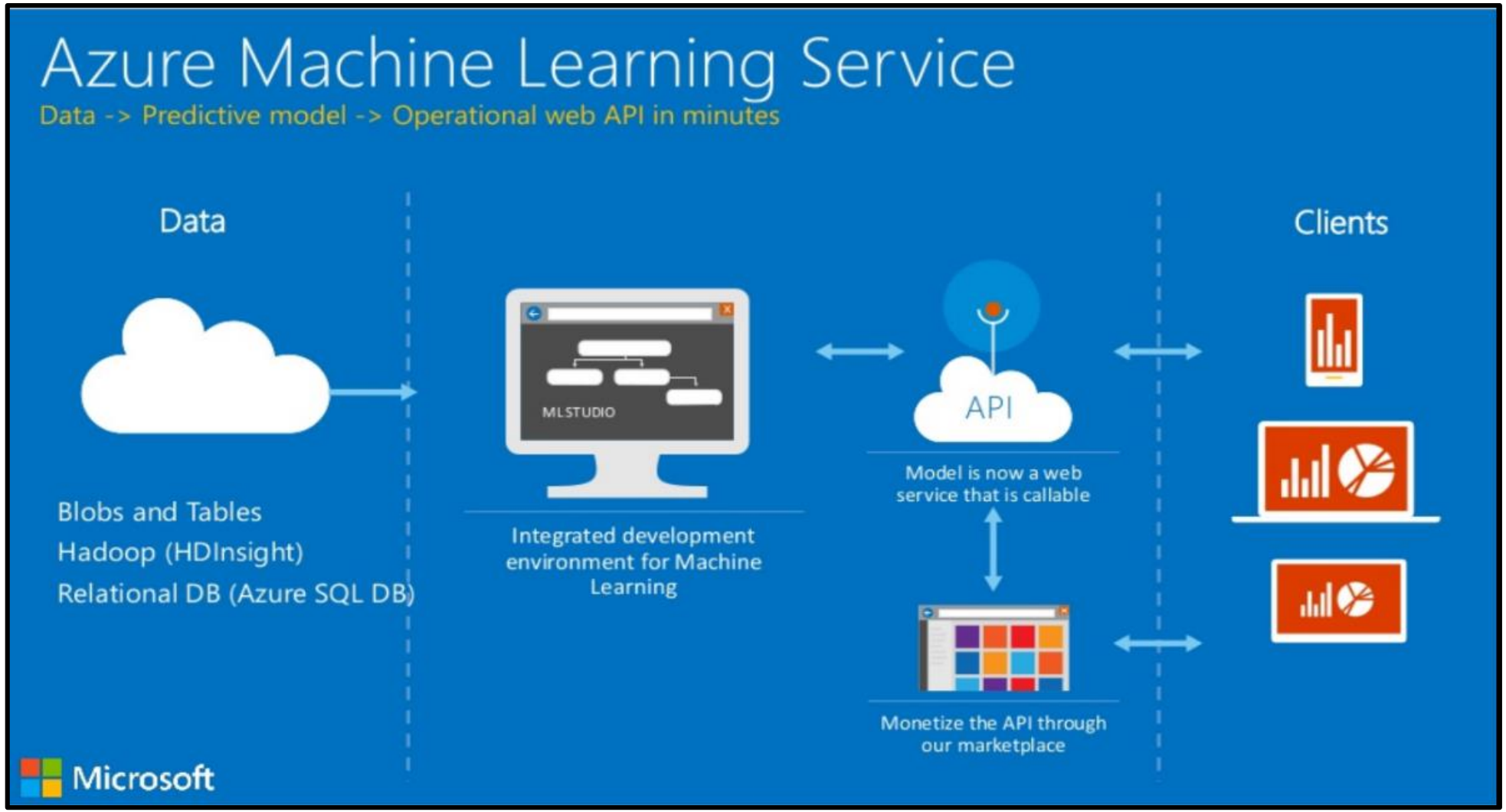
```
C:\>az ml -h

Group
    az ml: Access Machine Learning commands.

Subgroups:
    account          : Manage an account.
    asset            : Manage project assets.
    computetarget    : Access compute context related commands.
    env              : Environment related commands.
    experiment       : Execute machine learning experiments.
    history          : View run history of machine learning experiments.
    image            : Manage operationalization images.
    manifest         : Manage operationalization manifests.
    model            : Manage operationalization models.
    notebook         : Start a notebook server.
    project          : Access project related commands.
    runconfiguration: Access run configuration related commands.
    service          : Service related commands.
    workspace        : Access workspace related commands.
```

Where can Azure Machine Learning Services be used?

- Workbench
- Experimentation service
- Model management
- Visual Studio Code Tools for AI
- AI Toolkit for Azure IoT Edge
- MML Spark
- Data Science Virtual Machines
- HDInsight
- Machine Learning Studio



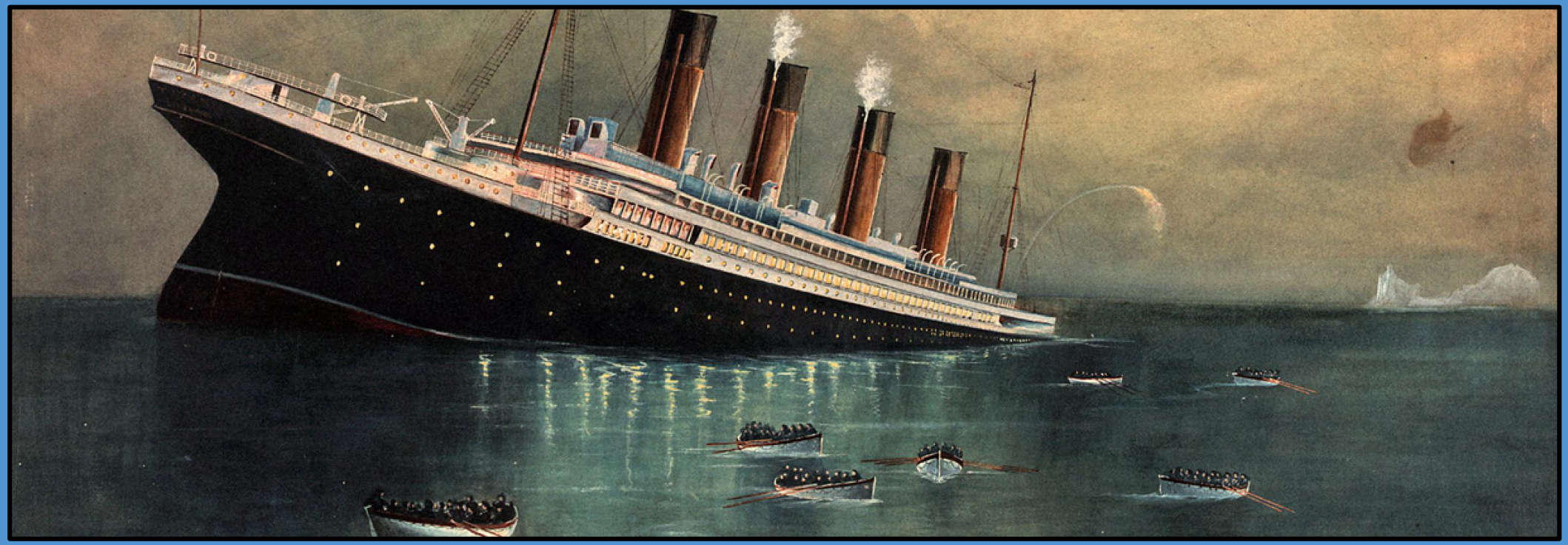
Azure Services Integration



Ref - https://www.slideshare.net/marafacs/azure-machine-learning-71568316

Demo

The Titanic Problem



Titanic : Machine Learning from Disaster | Kaggle

A Classical Machine Learning Problem where we have to predict whether a passenger traveling in RMS Titanic survived or not!

Questions?

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About the Speakers

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