

Working with the Azure Machine Learning Workflow

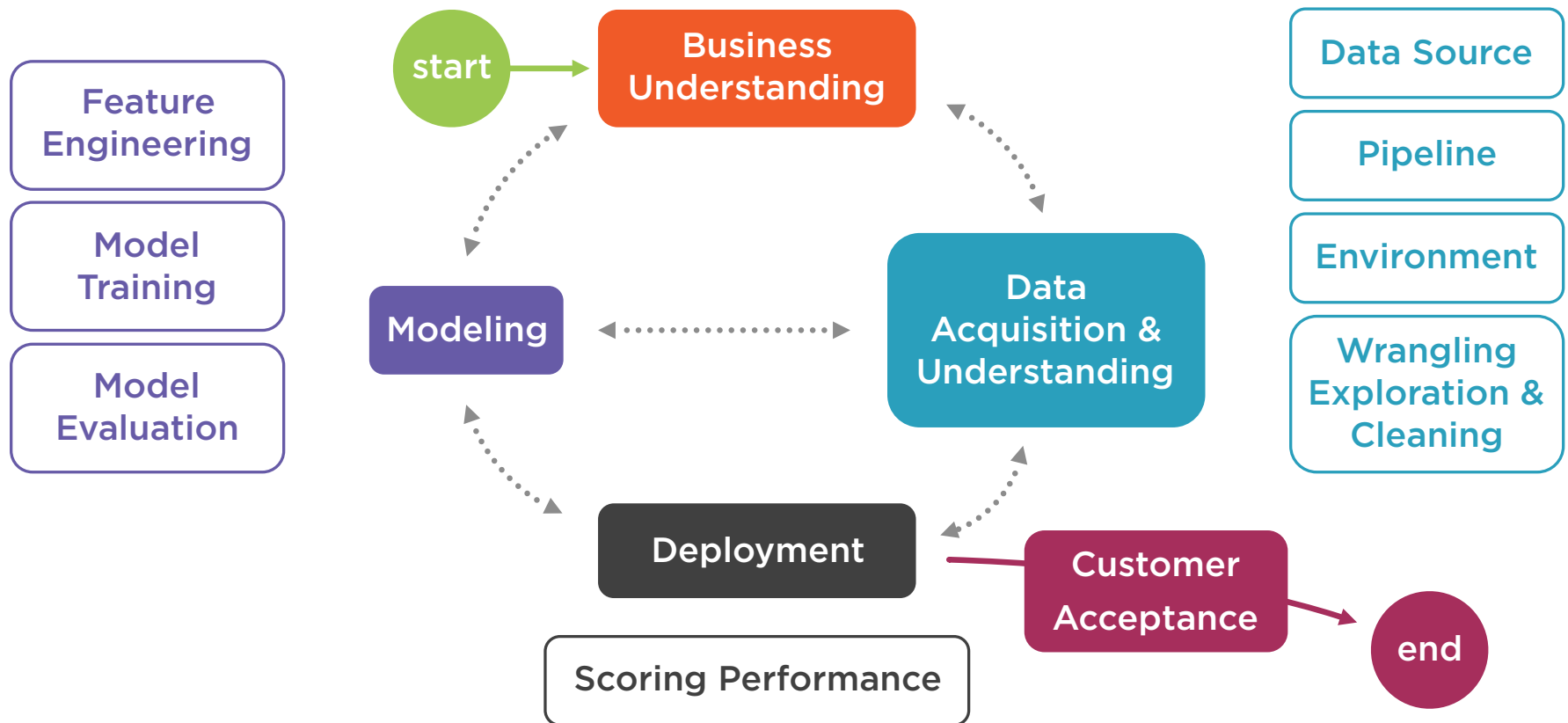


David Tucker

TECHNICAL ARCHITECT & CLOUD CONSULTANT

@_davidtucker_ www.davidtucker.net

Data Science Lifecycle



Overview

Reviewing the Azure Machine Learning workflow

Launching a Jupyter notebook instance

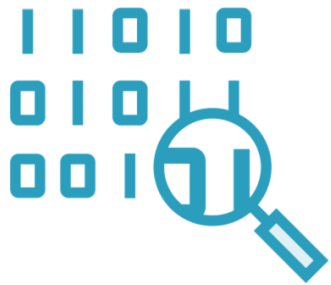
Download a public dataset from the Azure ML Python SDK

Train a model on an Azure ML compute cluster

Deploy a trained model on Azure ML as a web service

Azure Machine Learning Workflow

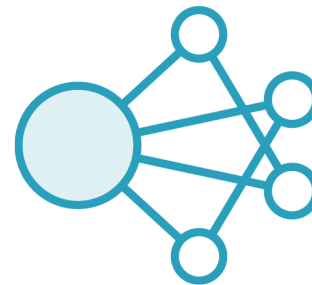
Azure Machine Learning



**Register
Data**



**Perform
Experiments**

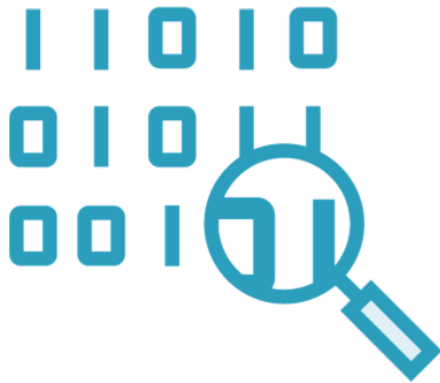


**Evaluate & Store
Models**



**Deploy
Models**

Register Data



Enables you to leverage both private as well as public curated datasets

Provides the ability to create reusable pipeline for data preparation

Equips you with tools to pull your data from Azure or outside data sources

Provides drag and drop tools for configuring data pipelines

Perform Experiments



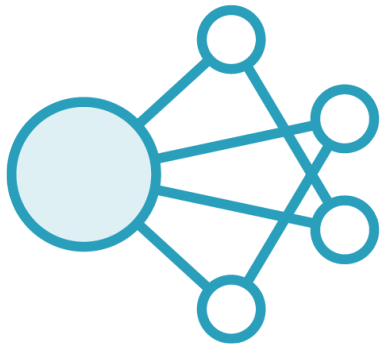
Provides CPU and GPU based infrastructure for experimentation

Enables dynamic scaling of learning infrastructure

Supports popular machine learning frameworks

Enables customization of infrastructure and frameworks

Evaluate & Store Models



Provides model storage within a workspace

Model can be stored from local experimentation or on compute cluster

Model can be from Azure Machine Learning experiment or elsewhere

Deploy Models



Some frameworks support zero code deployment

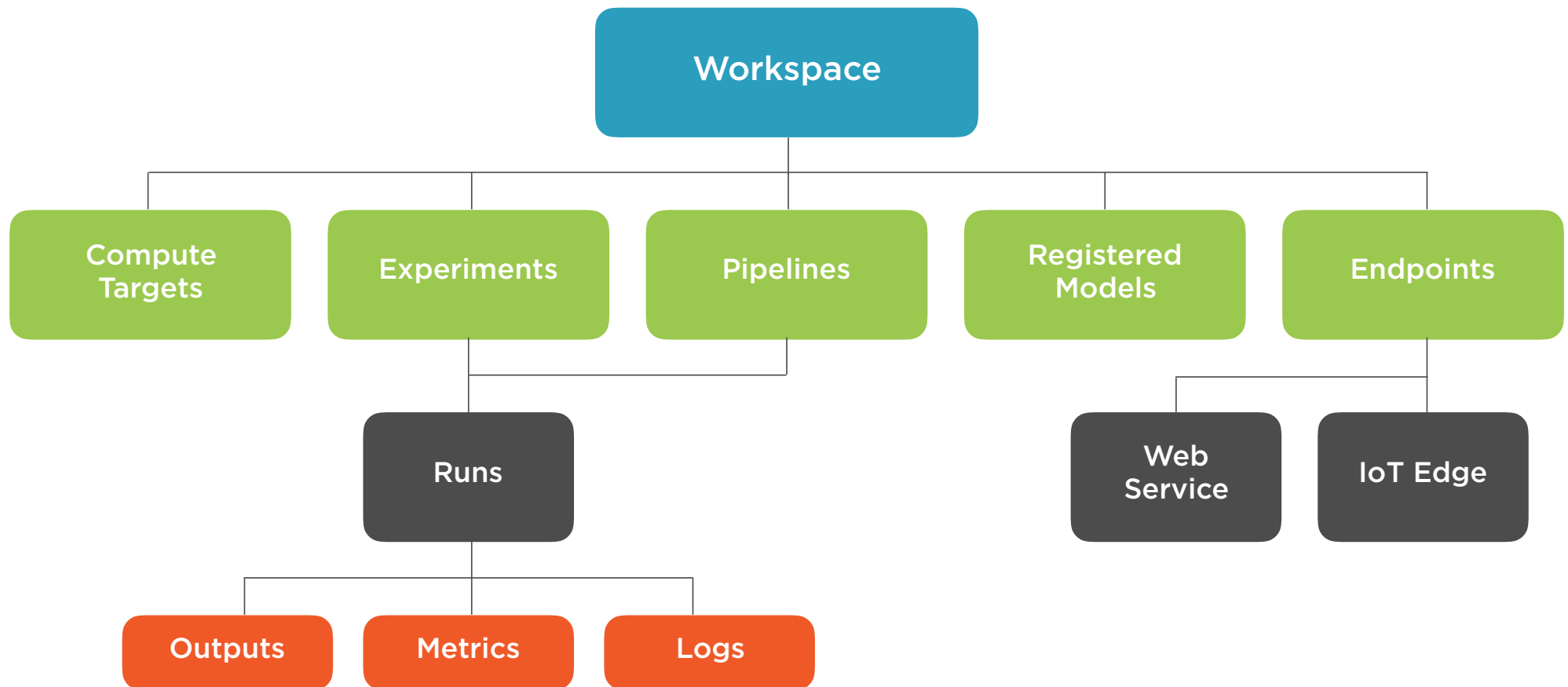
Most any framework can be supported with custom code

Enables inference to be available via SDK and REST-based endpoint

Supports Azure Container Instances and Azure Kubernetes Service (AKS)

Supports IoT Edge deployments

Azure Machine Learning



Interacting with Azure Machine Learning



IDE & CLI



Browser



Jupyter Notebook

Browser Access for Azure Machine Learning



Azure Machine Learning has two interfaces for the browser

Azure Machine Learning in the portal provides management functionality

Azure Machine Learning Studio is currently in preview

Azure Machine Learning Studio provides advanced tooling for in-browser training

Both will need to be leveraged for most projects

Jupyter Notebooks

Enable easy experimentation for data scientists

Minimize the need for configuration and environment management

Azure Machine Learning Service enables Notebook Virtual Machines

Can be less effective when working on team based projects

Launching a Notebook Server

Demo

Review capabilities of the new Azure Machine Learning Studio

Launch Jupyter Notebook Virtual Machine

Provision a compute cluster

Download a public data set

Visualize the data we will be working with

Leveraging Compute for Model Training

Compute Resources for Model Training



Local Compute



Remote Compute

Azure Remote Training Compute Targets

**Azure ML Compute
Cluster**

**Remote Virtual
Machine**

Azure Databricks

**Azure Data Lake
Analytics**

Azure HDInsight

Azure Batch

Azure ML Compute Cluster

Can scale up and down based on the current need

Provides both CPU and GPU based infrastructure options

Enables integration with ML pipelines

Works with Auto ML

Enables hyperparameter tuning

Model Training on Azure ML

There are multiple ways to train models on Azure Machine Learning from options that are completely customizable to options that don't require any custom code.

Training Methods on Azure ML

Run Configuration

**Automated Machine
Learning**

Estimators

**Machine Learning
Pipeline**

Training a Model

Demo

Creating an Experiment

Implementing a script for model training that will execute on a compute cluster

Implementing an Estimator

Configuring training environment

Running an Experiment

Registering our Model for reuse in the workspace

Deploying a Model

Demo

Retrieving our model from the workspace

Validating our saved model locally

Creating scoring script to perform inference from our model

Deploying our model as a web service

Validating service from the Python SDK

Validating service using HTTP requests

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