



MLOps managing data science project lifecycle

Faint background diagrams including a computer architecture diagram with 'mem' and 'proc' blocks, a network diagram with nodes and lines, and a vertical timeline or scale on the right side.

Dr. Ridi Ferdiana
Microsoft MVP
Microsoft Certified Trainers

The LinkedIn logo, a blue square with the white letters "in".

<https://mic.ms/ridi>



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aka.ms/devID

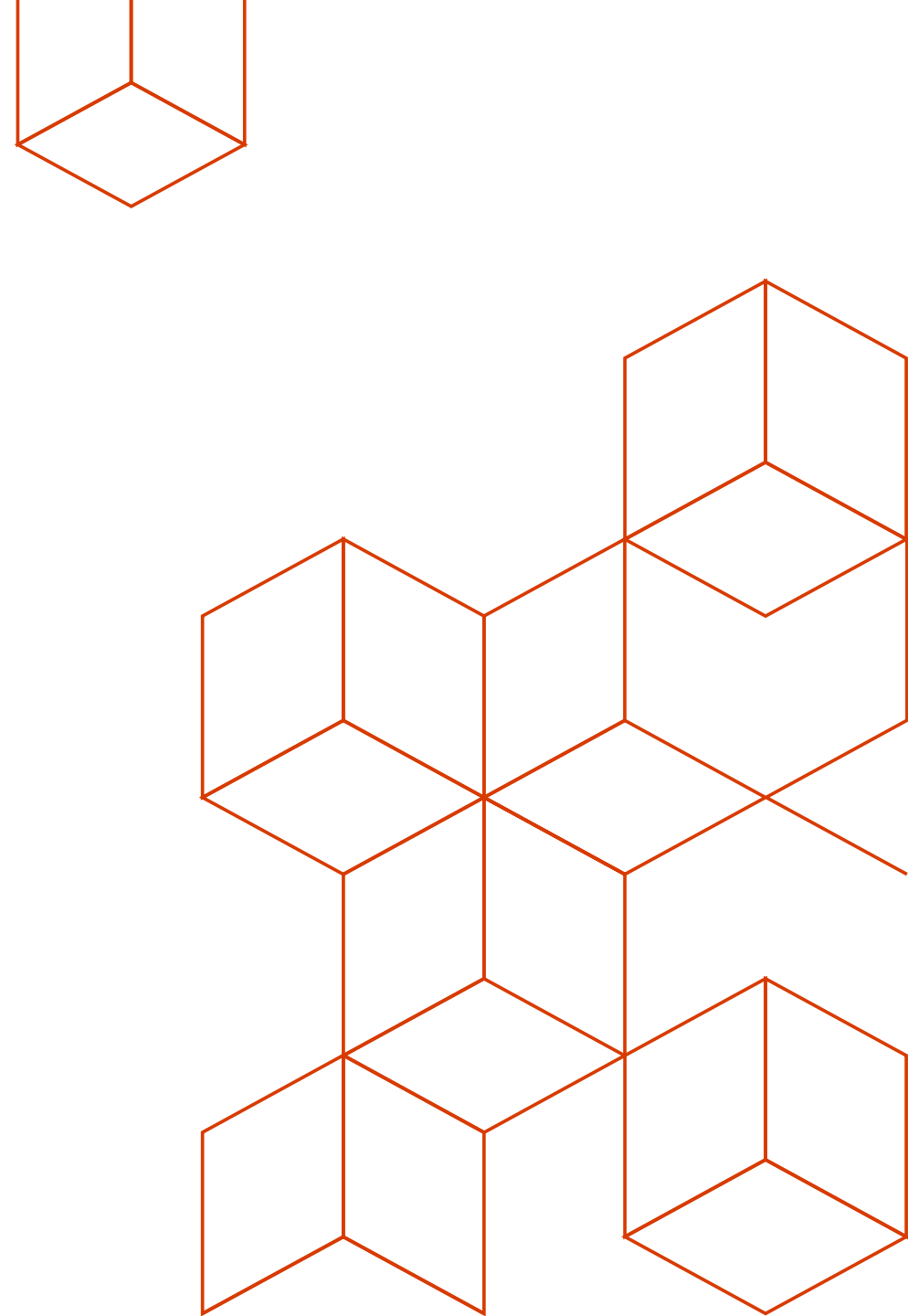
I am not an expert on DevOps,
so I can say “I don’t know”

– Ridi

Our Agenda in 45 Minutes

- Machine Learning Project in Microsoft Ecosystem
- MLOps vs AIOps vs DevOps
- MLOps in demonstration
- Discussion

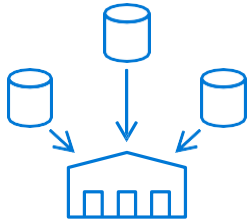
Machine Learning Project on Microsoft Ecosystem



Why we need Machine Learning?



Serving business users and end users with **intelligent** and **dynamic** applications



Build a unified and usable
database / dataset



Train ML and DL models to
derive insights



Operationalize models and
distribute insights at scale

How Microsoft Helps in Machine Learning

Domain Specific Ready to Use

To reduce time to market



Vision



Speech



Language



Search

Familiar Data Science Tools

To simplify model development



PyCharm



Jupyter



Visual Studio Code



Command line

Popular Frameworks

To build machine learning and deep learning solutions



PyTorch



TensorFlow



Scikit-Learn



ONNX

Productive Services

To empower data science and development teams



Azure
Databricks



Azure Machine
Learning



Machine
Learning VMs

Powerful Hardware

To accelerate deep learning



CPU



GPU



FPGA









From the Intelligent Cloud to the Intelligent Edge



Ready to use Machine Learning Solution






Vision

Recognize, identify, caption, index, and moderate your pictures, videos, and digital ink content.

-  [Computer Vision](#)
-  [Custom Vision](#)
-  [Face](#)
-  [Form Recognizer](#)
-  [Ink Recognizer \(Retiring\)](#)
-  [Video Indexer](#)




Language

Allow your apps to process natural language with pre-built scripts, evaluate sentiment and learn how to recognize what users want.

-  [Immersive Reader](#)
-  [Language Understanding \(LUIS\)](#)
-  [QnA Maker](#)
-  [Text Analytics](#)
-  [Translator](#)





Speech

Convert speech into text and text into natural-sounding speech. Translate from one language to another and enable speaker verification and recognition.

-  [Speech service](#)
-  [- Customize with Speech Studio](#) 


Decision

Build apps that surface recommendations for informed and efficient decision-making.

-  [Anomaly Detector](#)
-  [Content Moderator](#)
-  [Metrics Advisor \(preview\)](#)
-  [Personalizer](#)




Search

Add Bing Search APIs to your apps and harness the ability to comb billions of webpages, images, videos, and news with a single API call.

-  [Bing Search APIs hub page](#)




Cognitive Service Containers

Container support in Azure Cognitive Services allows developers to use the same rich APIs that are available in Azure, and enables flexibility in where to deploy and host the services that come with Docker containers.

-  [Cognitive Services containers documentation](#)
-  [What are Cognitive Service containers?](#)
-  [Create containers for reuse](#)
-  [Deploy and run container on Azure Container Instance](#)
-  [Deploy to Azure Kubernetes Service](#)
-  [Use Docker Compose to deploy multiple containers](#)
-  [Cognitive Services containers FAQ](#)

Cognitive Services for Big Data

The Cognitive Services for Big Data allows developers to use cognitive services within databases to apply intelligent algorithms over large datasets

-  [Cognitive Services for Big Data](#)
-  [Use Cognitive Services within Azure Databricks and Synapse Analytics](#)
-  [Python Samples](#)

If you really need a custom solution

Empower data science and development teams



Integrated data science & data engineering teams

Desktop solutions not adequate

Need a unified big data & machine learning solution



Azure Databricks

+



Azure Machine Learning
service



Individual data scientists

Desktop solutions adequate

Need cloud for sporadic compute needs



Machine Learning VMs

Azure Machine Learning Service

Set of Azure Cloud
Services



Python
SDK

That enables you to:

- ✓ Prepare Data
- ✓ Build Models
- ✓ Train Models

- ✓ Manage Models
- ✓ Track Experiments
- ✓ Deploy Models

DEMO

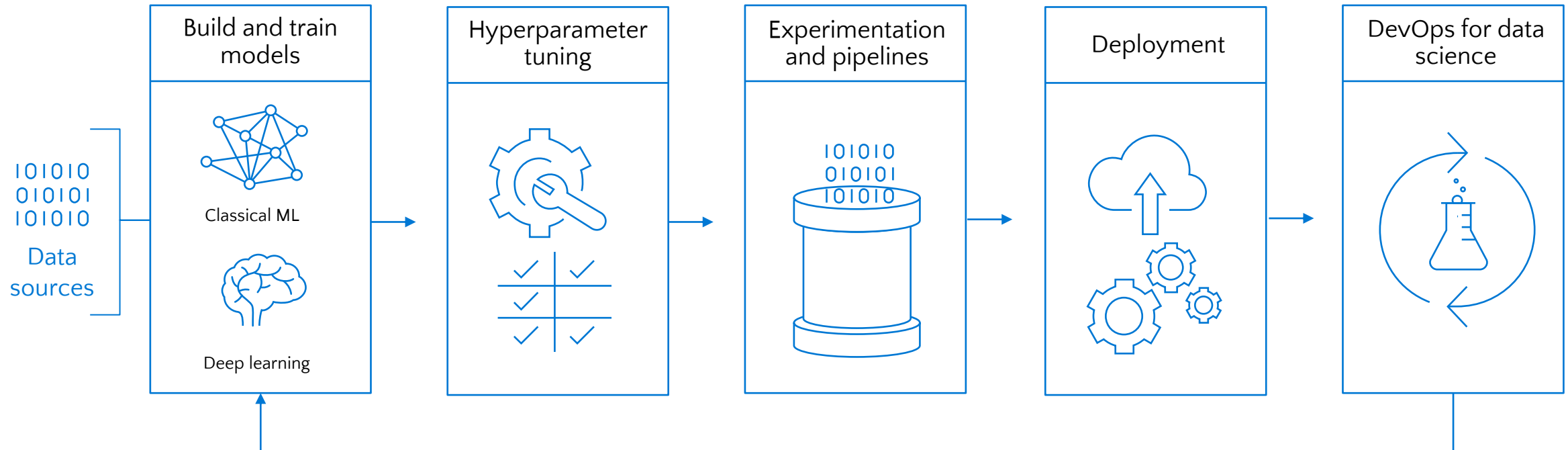
Azure Machine Learning Services



DevOps, AIOps, and MLOps

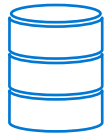


When DevOps meet Data Science



DevOps loop for data science

Prepare

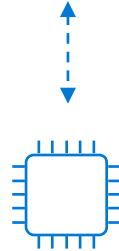
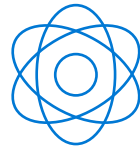


Prepare
Data

Experiment



Build model
(your favorite IDE)



Train &
Test Model



Register and
Manage Model

Deploy

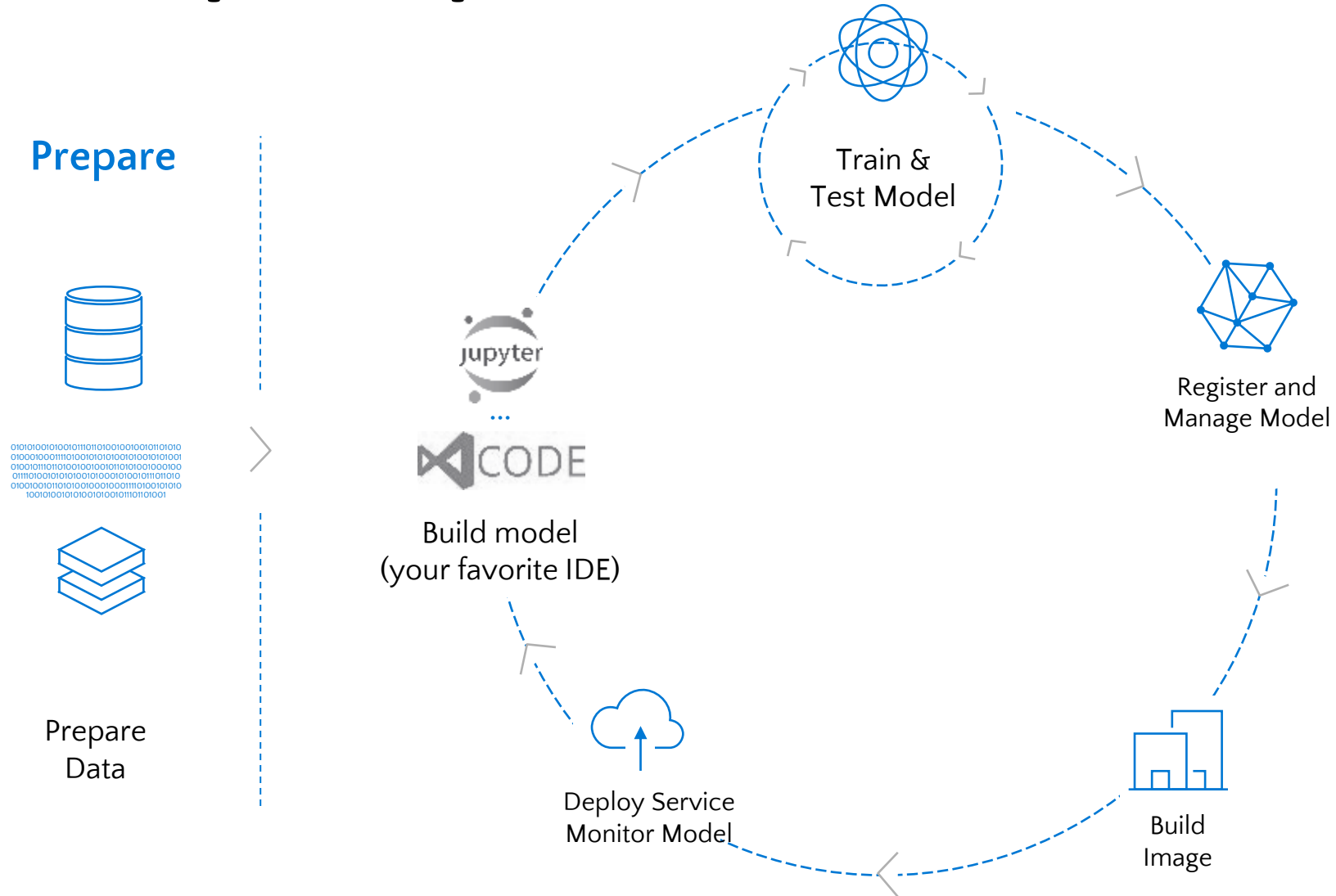


Build
Image



Deploy Service
Monitor Model

DevOps loop for data science



MLOps – Machine Learning Operations

when we want to “manage our data science /
Machine Learning project” in DevOps way.

So What is AIOps



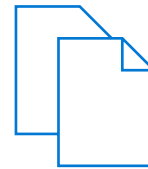
Understanding the Work Patterns

How our developer velocity? How development teams work in specific configuration?



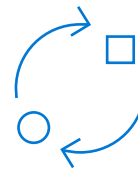
Understand the Production Data

How we can improve the production software, sizing? Availability?



Aggregate The DevOps Log

Build, Bugs, Burndown Chart, how can we improve the team pace?



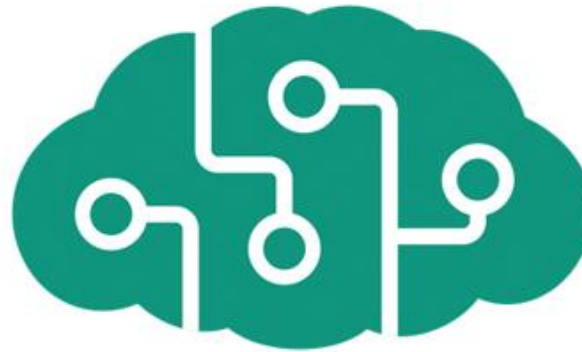
Improving insight for Better Productivity

How we can avoid 'cold start' for a new project by learning from the past

AIOps vision



Customer satisfaction enabled by
AI/ML
(Behaviors, Engagement, Support)



 Microsoft
Cognitive Services

Service with built in Intelligence
(Aware, Adapt/Heal, Low Human
Intervention)



Engineering Powered by AI / ML
(Automation DevOps process)

AIOps – Artificial Intelligence Operations

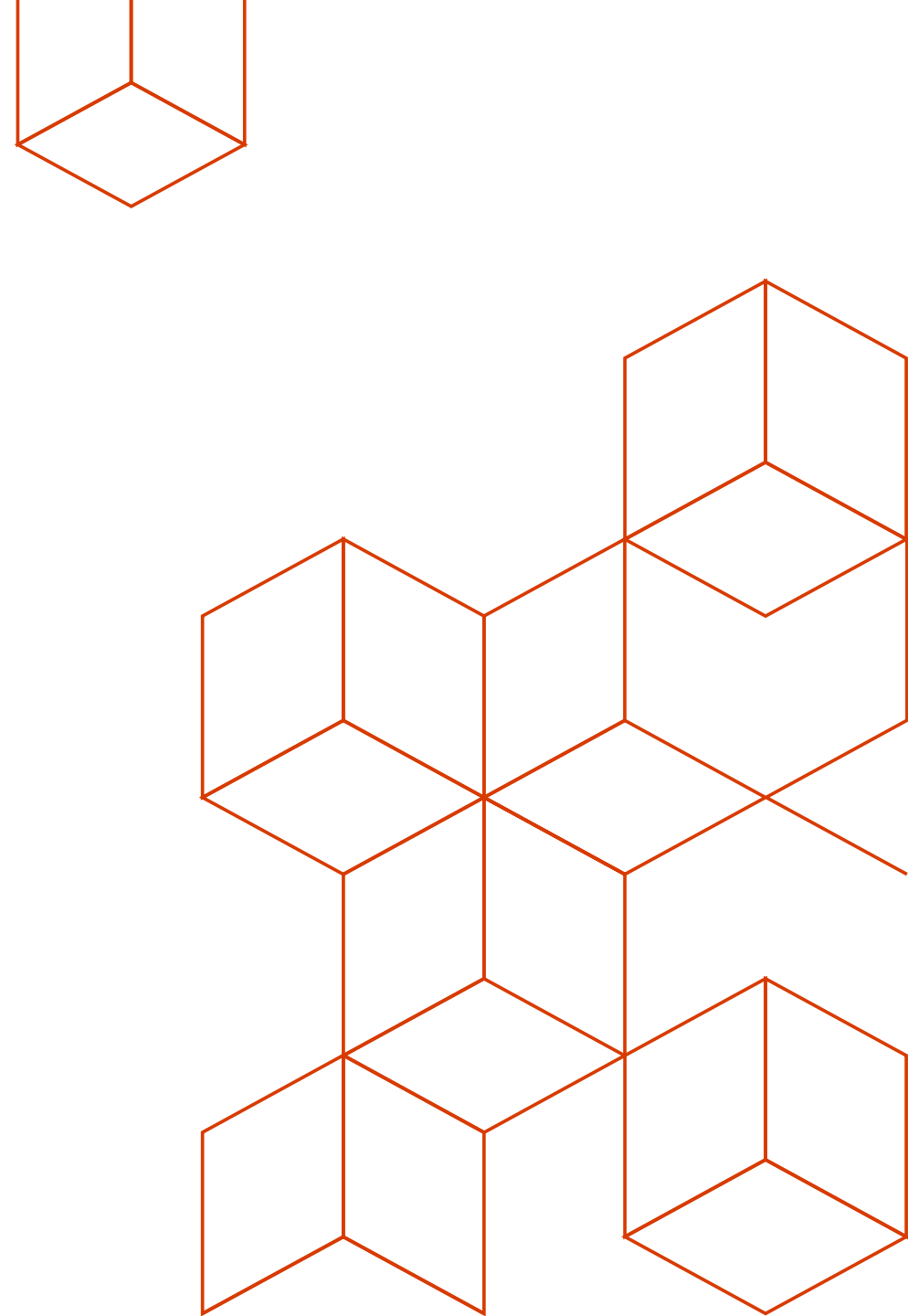
when we want to “manage our
DevOps project” in AI way.

DEMO

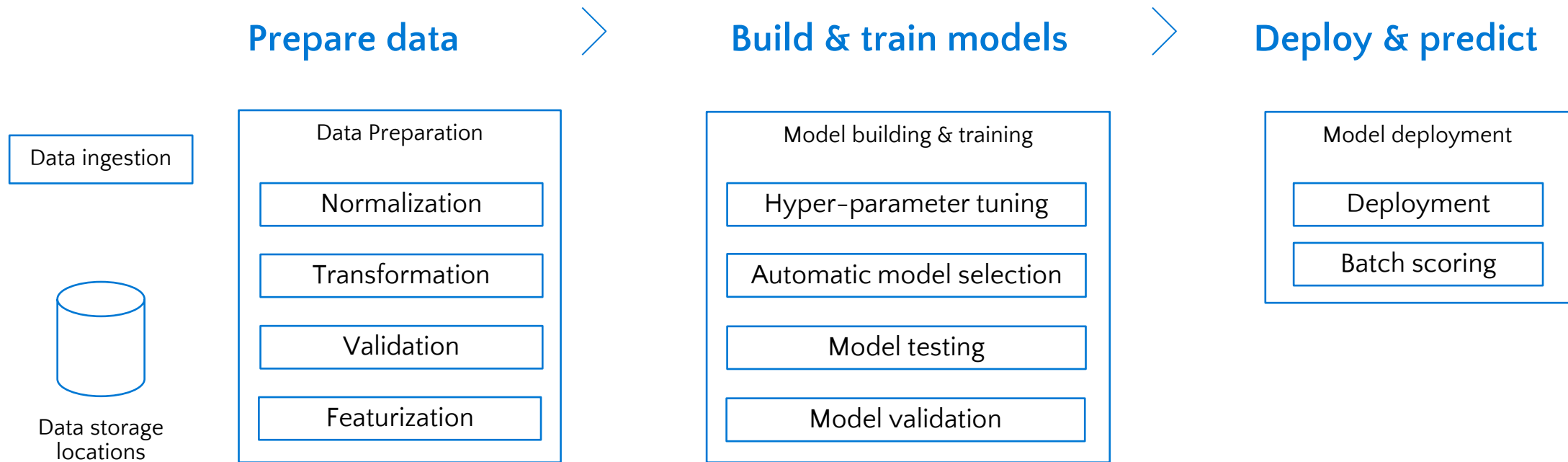
AIOPs in Microsoft Azure



MLOps in Demonstration



Typical MLOps Scenario

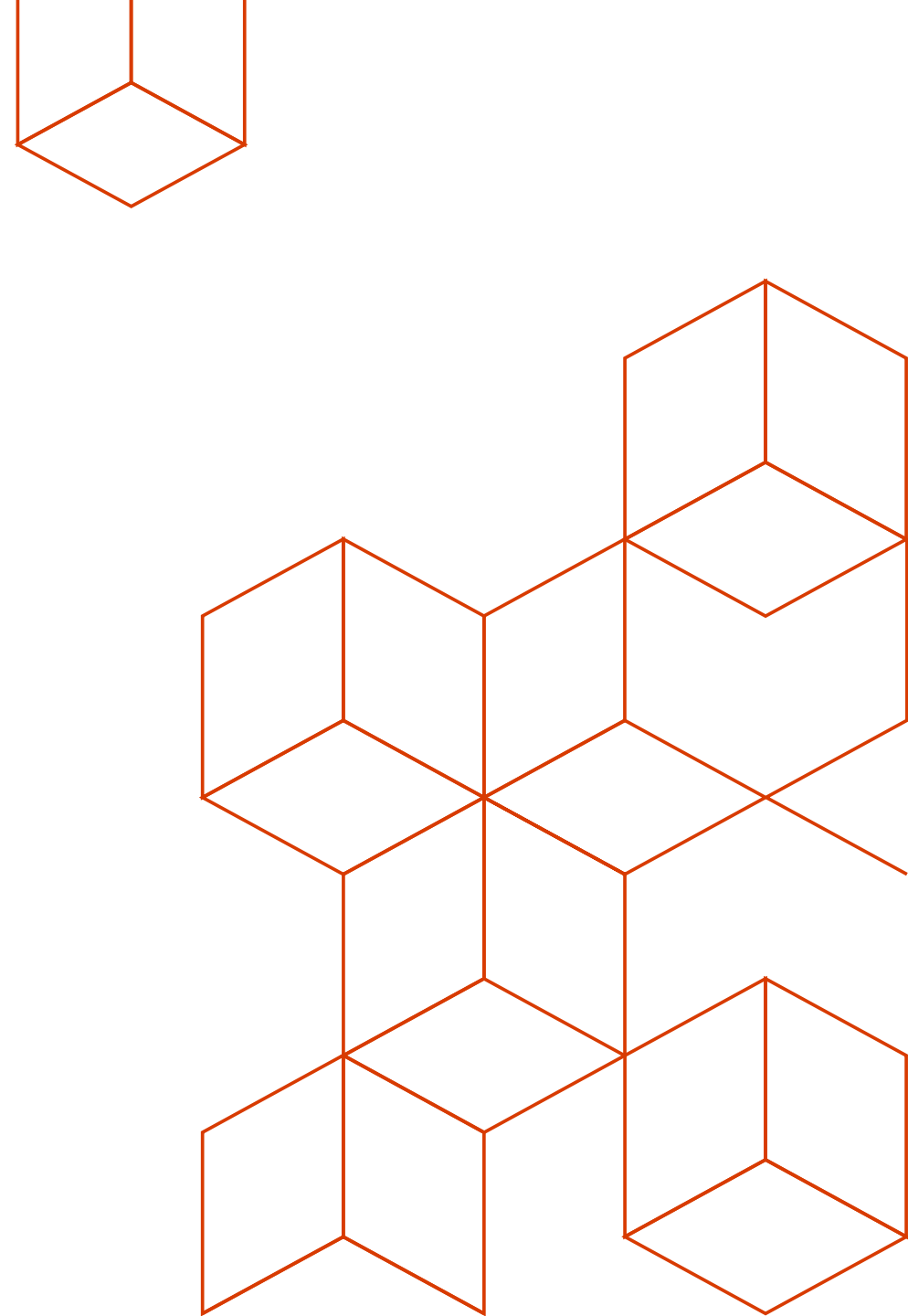




Demonstration

- Case 1: Create event driven Machine Learning workflows
- Case 2: Managing your Artifacts and Codes
- Case 3: CI/CD with Github Actions

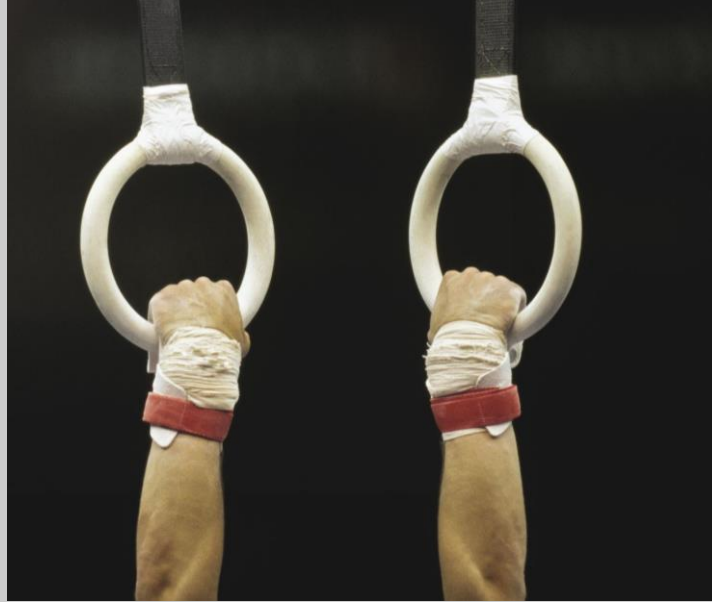
Summary



Summary



Today you can build two type projects in DevOps environment: Software Development Project and Data Science Project



AIOPs will help you to improve your DevOps process to be better



MLOps will help to improve Data Science Project with the DevOps

Three Ways Analytics Can Help: Respond, Adapt, and Save



Synopsis:

Discover how to quickly deliver insights from all your data more efficiently with a limitless analytics service that brings together data warehousing and big data analytics.



Shorten Link: aka.ms/3WaysAnalyticsCanHelp



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**MLOps managing data science project
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