

### Module 4 - MLOps – What it is , Why MLOps

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[github.com/jiportilla/giveback](https://github.com/jiportilla/giveback)

# Objectives of This Module

Upon completion of this module, you will understand:

## **MLOps - What & Why**

- Definition & People of MLOps - <https://ml-ops.org/>
- Key MLOps Features
  - Model Development
  - Monitoring
  - Productionalization & Deployment
  - Iteration & Lifecycle
  - Governance
- Lab: Intro to MLOps

# Spring 2024

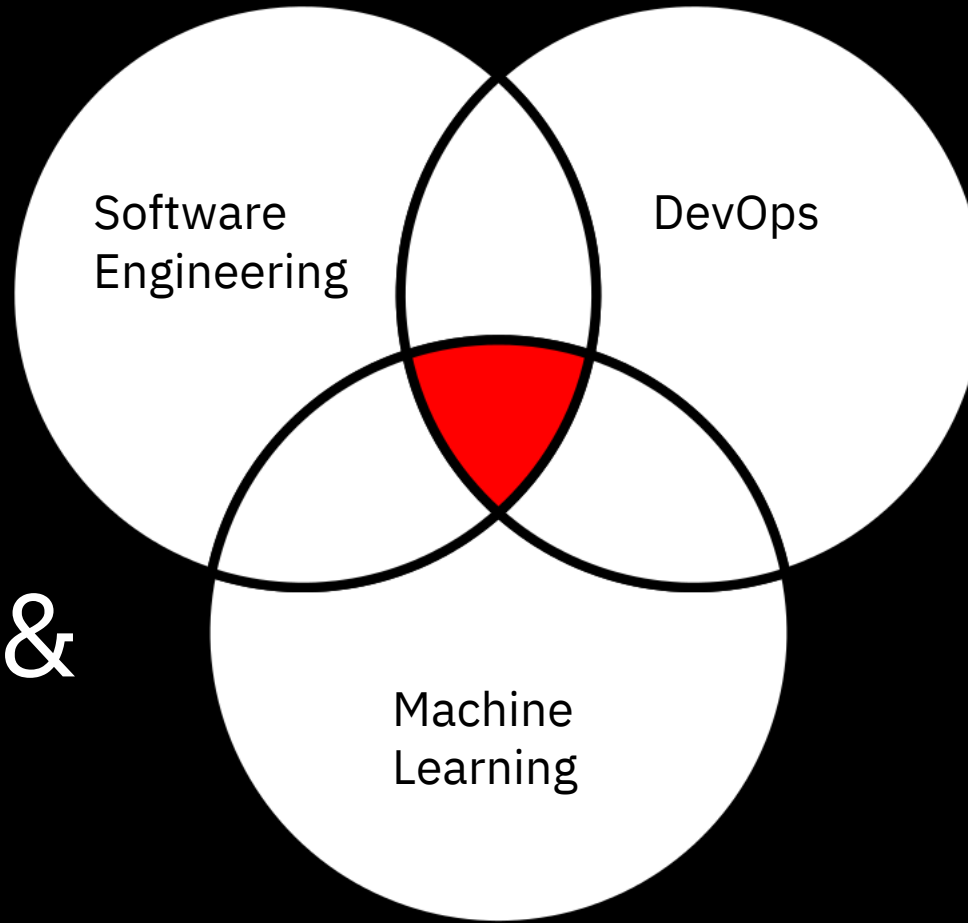
## 5360 Advanced Business Analytics

- This course will give students the language, knowledge, and actionable methods to work alongside technical and non-technical members of your team to create AI solutions.
- Students will explore what it means to design artificial intelligence systems as a team, guided by a clear intent and a focus on people. This course will give you the framework and tools you need to recognize responsible AI design, align your team, and work with data sources to start building AI solutions.
- Students will learn the tools, technology, and practices that enable cross-functional AI teams to efficiently deploy, monitor, retrain, and govern models in production systems.

# Re-cap

1. MLOps definition
2. Data Project Roles
3. AutoAI experiment

**MLOps** is the  
**convergence** of  
Software  
Engineering,  
Machine learning &  
DevOps



# Requirements to Achieve MLOps



❑ Reproducible

Must be able to **re-train** a 9-month-old model to within few %

❑ Accountable

Must be able to **track back** from model in Production to its provenance

❑ Collaborative

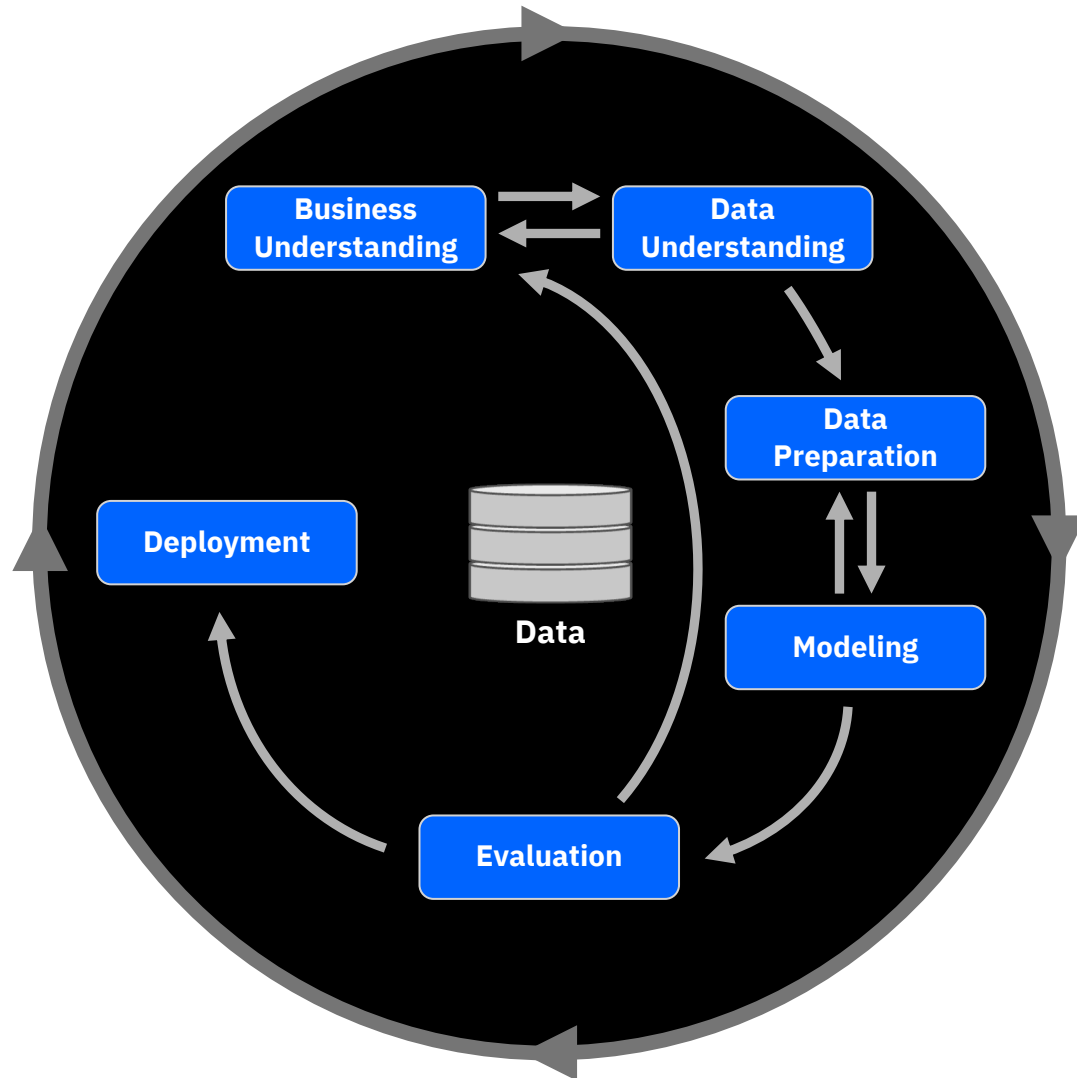
Must be able to do **asynchronous** collaboration

❑ Continuous

Must be able to **deploy automatically** & monitor statistically

# Solution Development Method Approach

CrossIndustry Standard Process for Data Mining (CRISP-DM)



## Seven steps to successful Data Mining/Predictive Analytics

1. Define the business challenge in a precise statement
2. Define the data model and data requirements
3. Source data from all available repositories
4. Evaluate the data quality
5. Select the machine learning algorithm
6. Interpret the results and iterate to improve model
7. Deploy the model into your business

# AI Project Roles



Drives governance  
policy effectiveness  
while tracking how data  
is used and its value to  
the company

## Data Steward

Builds data pipelines that power  
dashboards and data platforms  
while ensuring high quality

## Data Engineer

Prepares data to tease out  
the insights they're looking  
for, without IT involvement

## Data Scientist



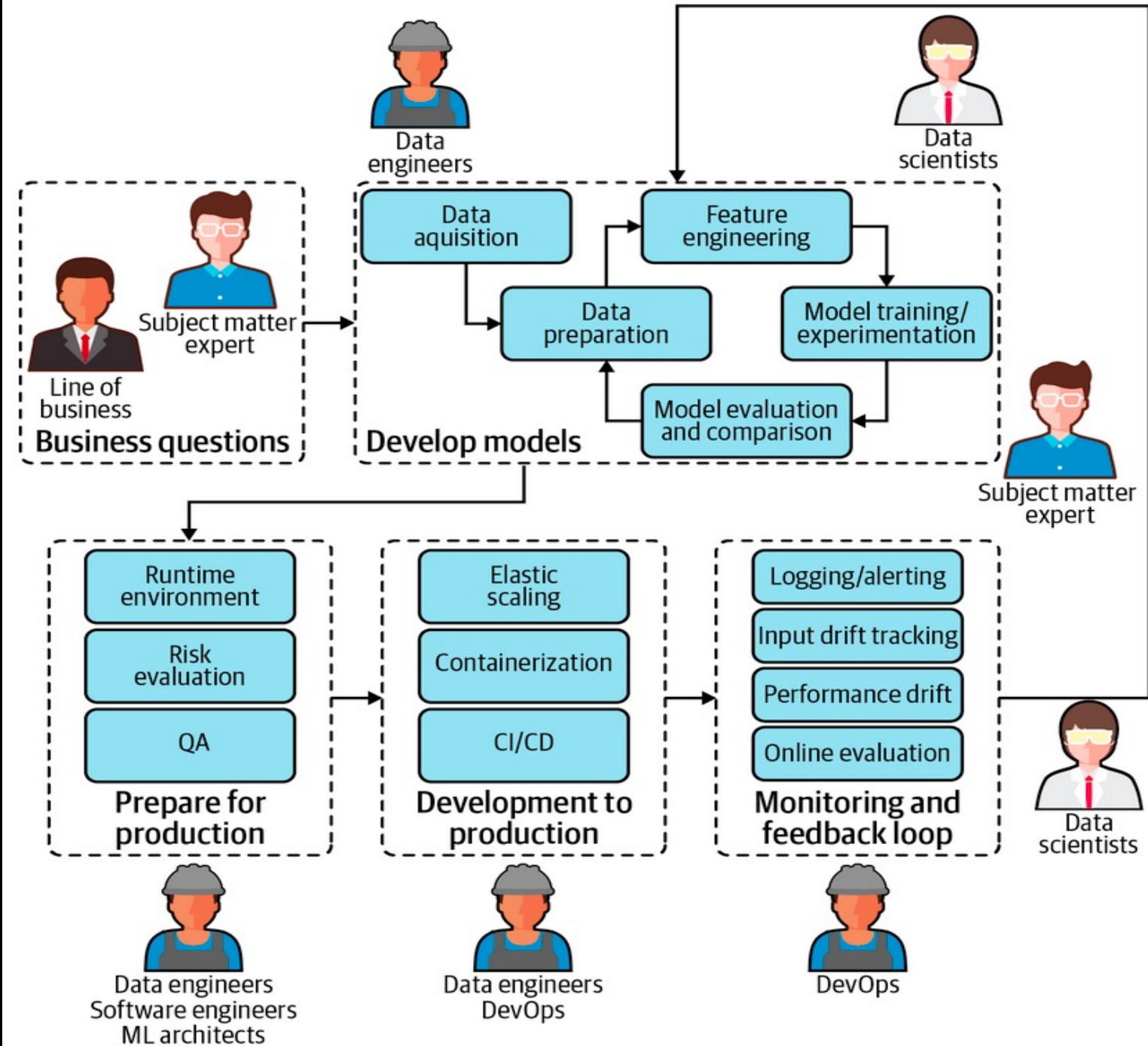
## Business Analyst

Works with data to apply insights  
to the business strategy

## App Developer

Makes insights immediately  
actionable and adds intelligence  
to apps in straightforward manner

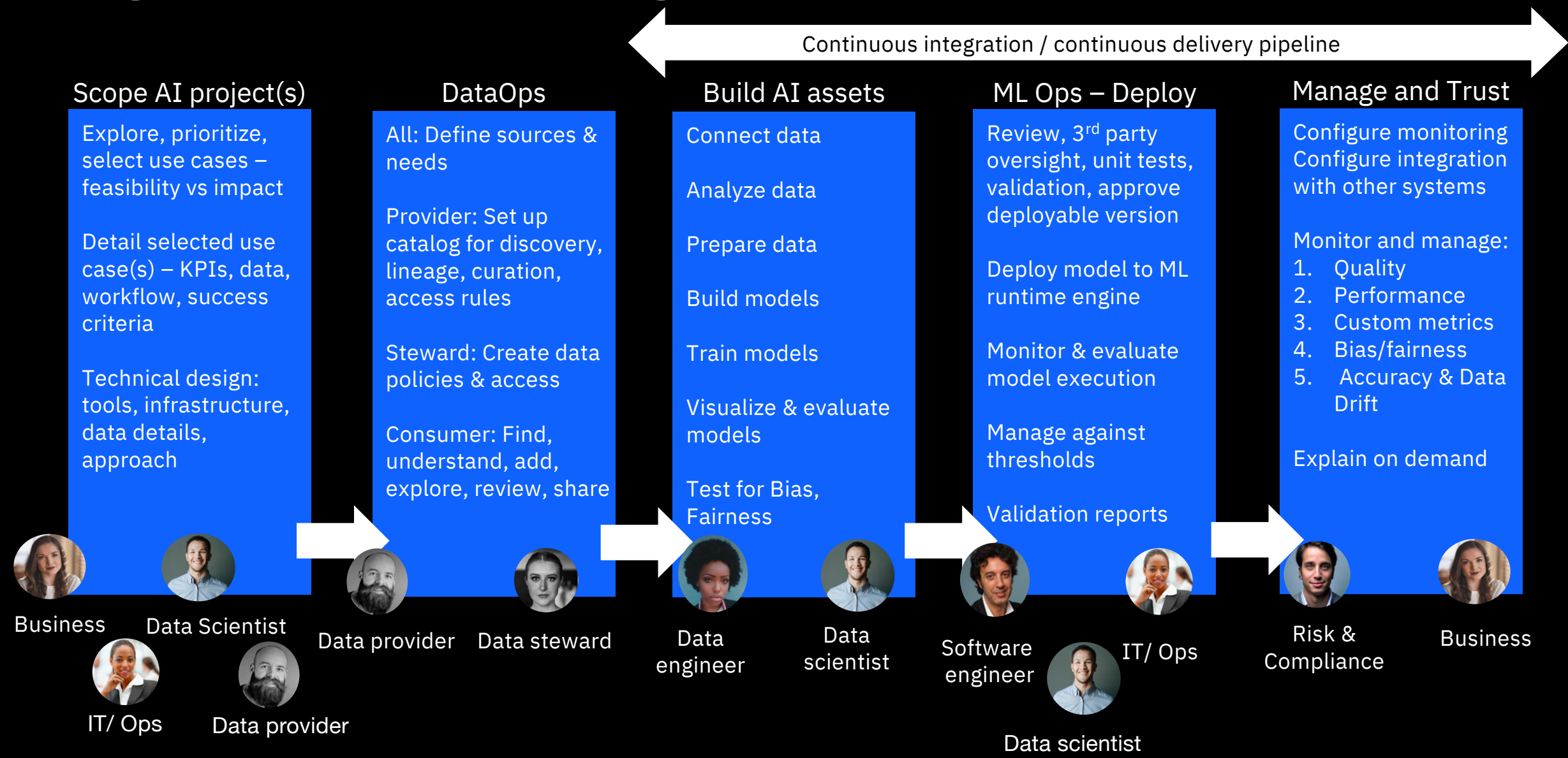
Enterprise ML Lifecycle



# Use case

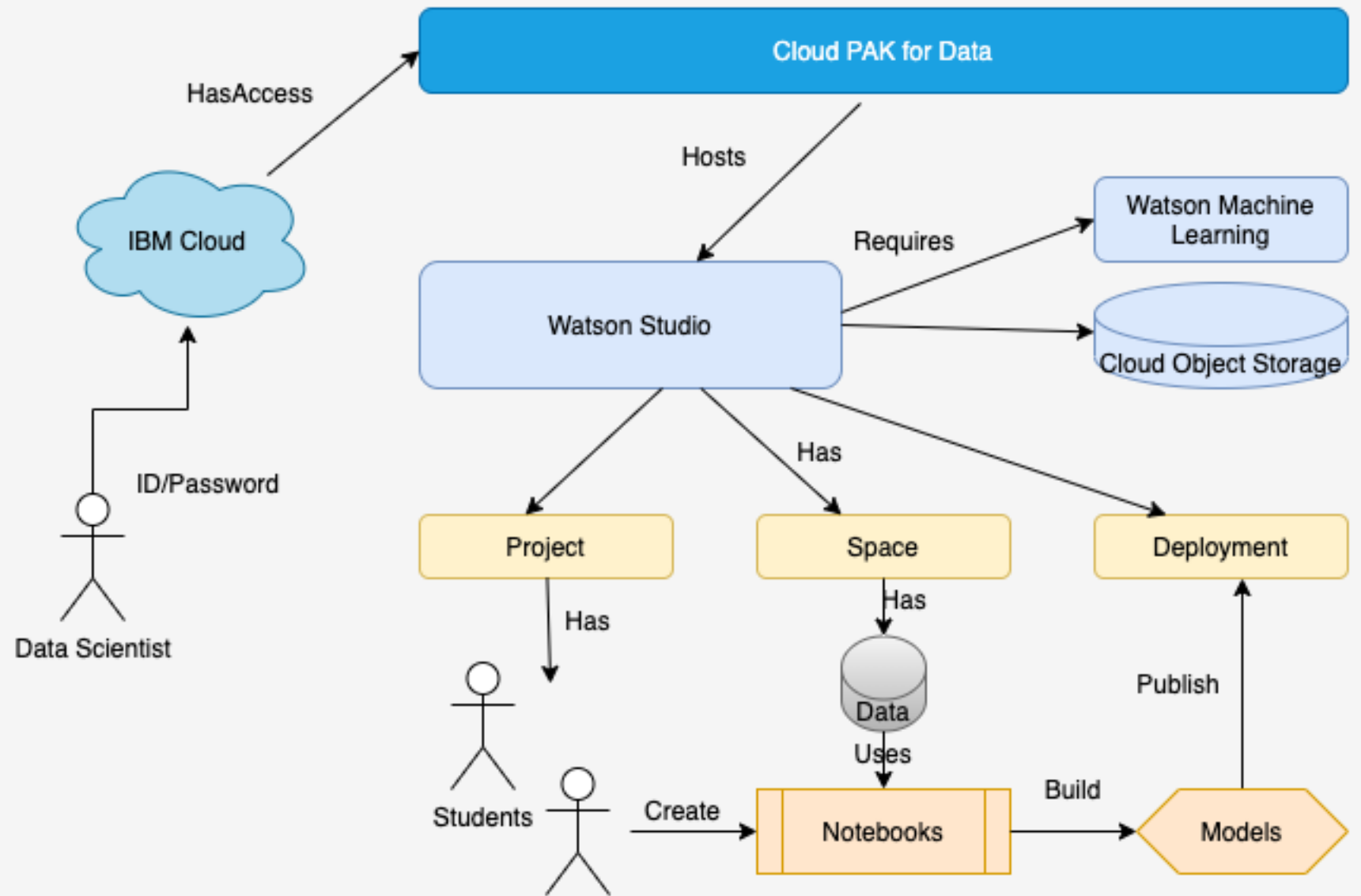
1. Operationalized AI stages
2. Best practices

# Stages in Operationalizing AI



# Demos - Lab

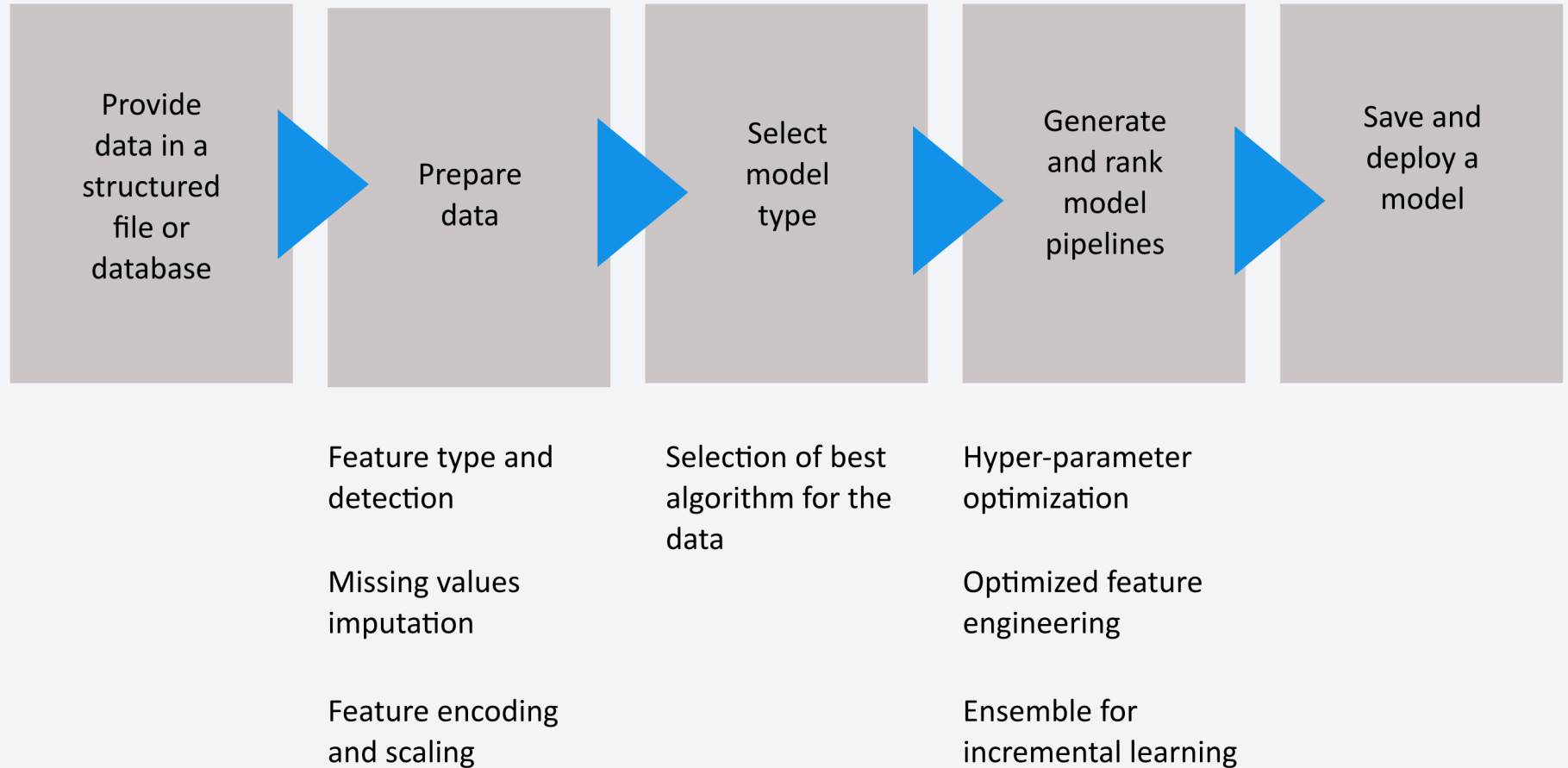
# Watson Studio Model Deployment



<https://dataplatform.cloud.ibm.com/>


# Watson Studio Model Deployment

## AutoAI



# Watson Studio Model Deployment

<https://developer.ibm.com/learningpaths/get-started-watson-studio/>

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Data science > Analyze structured and unstructured data to extract knowledge and insights.

Learning Path

**Take control of your data with Watson Studio**

☆ Save 👍 Like

☒ Overview


☐ Introduction to IBM Watson Studio

☐ Initial data exploration

☐ Build, deploy, and trust models

☐ Test and validate machine learning models

☐ Summary

Your privacy choices 


Learning Path

Take control of your data with Watson Studio

Tutorials, articles, and other resources to solve your data science and machine learning needs

By Rich Hagarty, Einar Karlsen

Updated December 12, 2022 | Published June 1, 2021

 To save your progress, you must be logged in to IBM Developer [Log in now](#)

Overview

IBM Watson Studio simplifies the process of experimentation to deployment, as well as data exploration, model development, and training. It lets you build, run, and manage AI models, and optimize decisions anywhere on IBM Cloud Pak for Data. You can bring together open source frameworks like PyTorch, TensorFlow, and scikit-learn with IBM for code-based and visual data



# Watson Studio Model Deployment

IBM Cloud Pak for Data

Search in your workspaces

Upgrade

Docs / Analyzing data and working with ... / AutoAI

Find information

Overview

Services and integrations

Getting started

Projects

Preparing data

Analyzing data and working with models

Notebooks and scripts

Cognos Dashboards

AutoAI

Federated learning

Decision Optimization

SPSS Modeler

Visualizing your data

Deploying models and other assets

Data governance

AI governance

Troubleshooting

Administration

Glossary

AutoAI Overview

Last updated: Jan 12, 2024

The AutoAI graphical tool analyzes your data and uses data algorithms, transformations, and parameter settings to create the best predictive model. AutoAI displays various potential models as model candidate pipelines and rank them on a leaderboard for you to choose from.

Show tools & services map

Required service

Watson Machine Learning

Watson Studio

Data format

Tabular: CSV files, with comma (,) delimiter for all types of AutoAI experiments.

Connected data from IBM Cloud Object Storage.

Note:

You can use a data asset that is saved as a Feature Group (beta) but the metadata is not used to populate the AutoAI experiment settings.

Data size

Up to 1 GB or up to 20 GB. For details, refer to AutoAI data use.

AutoAI data use

These limits are based on the default compute configuration of 8 CPU and 32 GB.

AutoAI classification and regression experiments:

You can upload a file up to 1 GB for AutoAI experiments.

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# Watson Studio Model Deployment

<https://www.ibm.com/downloads/cas/XGVY8QA5>

<https://arxiv.org/pdf/2007.01977.pdf>

[https://mediacenter.ibm.com/media/IBM+Watson+Machine+LearningA+Run+a+sample+AutoAI+experiment/1\\_6fl7dh43/99375561](https://mediacenter.ibm.com/media/IBM+Watson+Machine+LearningA+Run+a+sample+AutoAI+experiment/1_6fl7dh43/99375561)

<https://www.coursera.org/learn/ibm-rapid-prototyping-watson-studio-autoai#modules>

## Building a Rapid Prototype with Watson Studio AutoAI

Module 1 • 2 hours to complete



## Automated Data Preparation and Model Selection

Module 2 • 2 hours to complete



## Automated Feature Engineering and Hyperparameter Optimization

Module 3 • 2 hours to complete



## Evaluation and Deployment of AutoAI-generated Solutions

Module 4 • 2 hours to complete



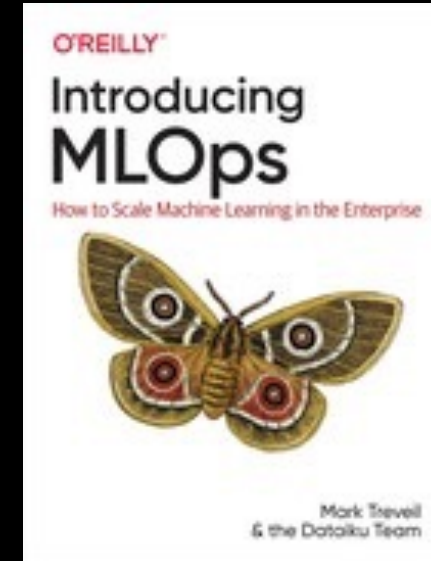
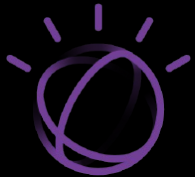
# Watson Studio Model Deployment



Q & A

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<https://medium.com/inside-machine-learning/ai-ops-managing-the-end-to-end-lifecycle-of-ai-3606a59591b0>