Module 4 - MLOps – What it is , Why MLOps

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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
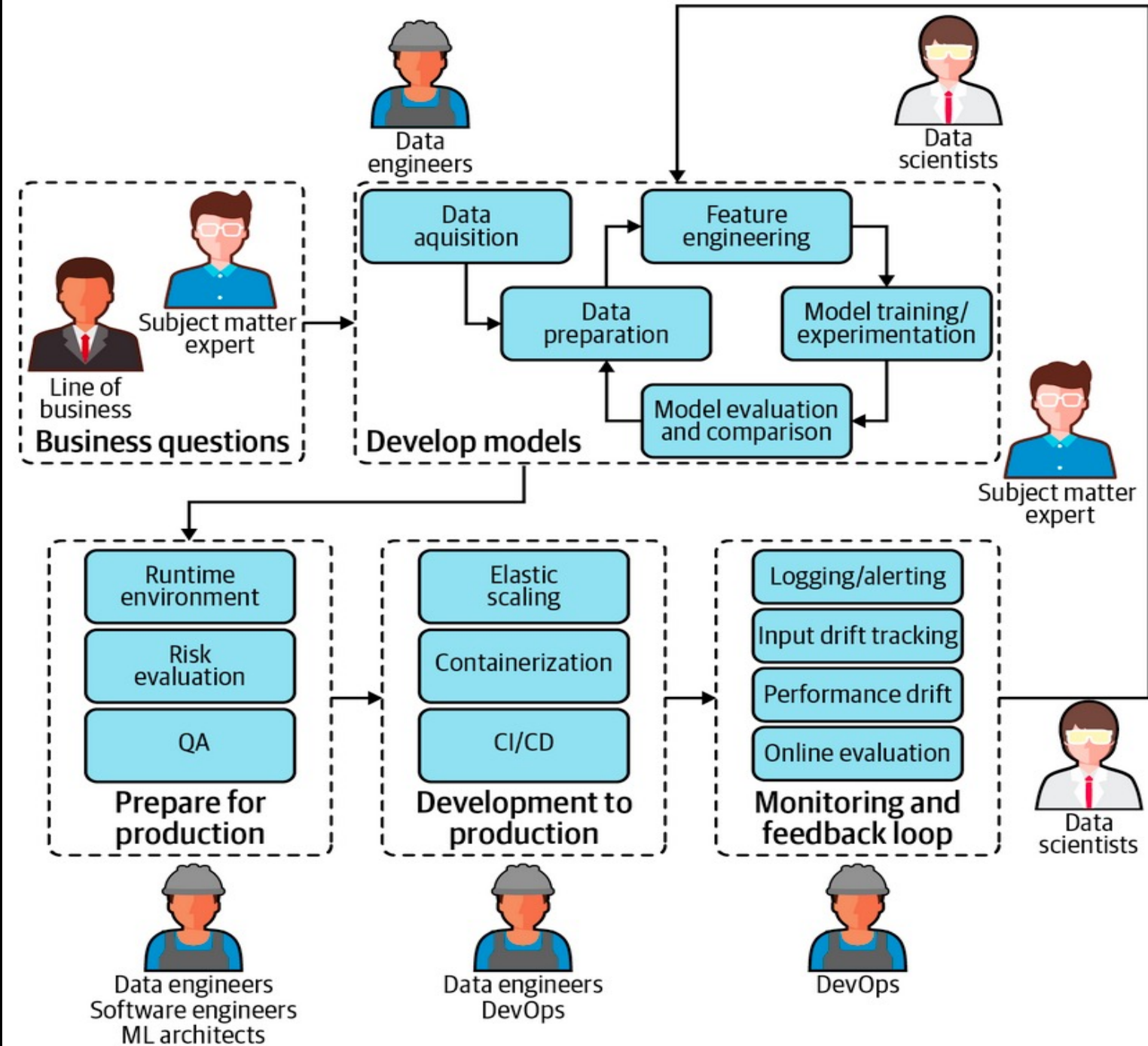 - Governance
- Lab: Intro to MLOps

Fall 2021
BADM 4830 / BAIM 4200 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. Enterprise ML Lifecycle
2. AI Project Roles

Enterprise ML Lifecycle

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

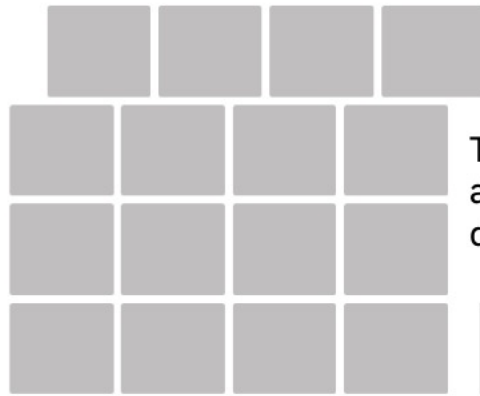Makes insights immediately actionable and adds intelligence to apps in straightforward manner

Agenda

MLOps What & Why

1. Agile Scrums
2. MLOps in Action

What's a Sprint?

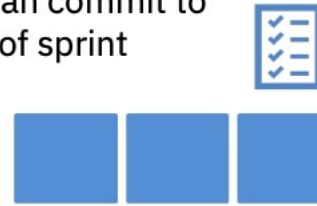
Inputs from Customers, Team, Managers, Executives

Team selects starting at top as much as it can commit to deliver by end of sprint

Daily Stand-up

Sprint 2-4 weeks

How

Daily Standups meeting

Sprint Review

Finished work

Delivery

Product Backlog

Prioritized list of what is required: features, specs...

Sprint Backlog

Task Breakouts that are clearly articulated and with content ready to go.

Iteration

Sprint end date and team deliverable do not change

Potentially shippable product increment

Critical to continuous improvement:

Retrospectives

KPI measurement

What & Why   When

Scrum teams commit to ship working software through set intervals called sprints. They use learning loops to quickly gather and integrate customer feedback.

Agile development

https://bundles.yourlearning.ibm.com/ibm/agile-academy/#NKQGVPWNYEQD9Z6G/GYJPZPDMDDDY14YZ/EKEPDPWDEEVV53JR

https://trello.com/b/BF7qYmLe/chatbots

https://trello.com/b/TUjhwR84/team-1
https://trello.com/b/AQQgE2vb/team-2
https://trello.com/b/ID42x6do/team-3

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ML Operationalization – High Level Steps and Personas

ML Operationalization refers to operationalization of Machine Learning Models for production use to realize business value out of those Models.

ML Operationalization overlays paradigm of DevOps on Model Lifecycle management process (CRISP-DM)

For Conceptual View of ML Ops please check - https://ibm.co/AI-Ops

Stages in Operationalizing AI

Continuous integration / continuous delivery pipeline

Scope AI project(s)

Explore, prioritize, select use cases – feasibility vs impact

Detail selected use case(s) – KPIs, data, workflow, success criteria

Technical design: tools, infrastructure, data details, approach

DataOps

All: Define sources & needs

Provider: Set up catalog for discovery, lineage, curation, access rules

Steward: Create data policies & access

Consumer: Find, understand, add, explore, review, share

Build AI assets

Connect data

Analyze data

Prepare data

Build models

Train models

Visualize & evaluate models

Test for Bias, Fairness

ML Ops – Deploy

Review, 3rd party oversight, unit tests, validation, approve deployable version

Deploy model to ML runtime engine

Monitor & evaluate model execution

Manage against thresholds

Validation reports

Manage and Trust

Configure monitoring Configure integration with other systems

Monitor and manage:
1. Quality
2. Performance
3. Custom metrics
4. Bias/fairness
5. Accuracy & Data Drift

Explain on demand

Business

Data Scientist

IT/ Ops

Data provider

Data provider

Data steward

Data engineer

Data scientist

Software engineer

IT/ Ops

Data scientist

Risk & Compliance

Business

Trustworthy AI

https://learn.ibm.com/course/view.php?id=8717

The need for trust in AI has been of importance and one way of achieving it is through comprehending how machine learning models predict labels by various means throughout the AI application lifecycle.
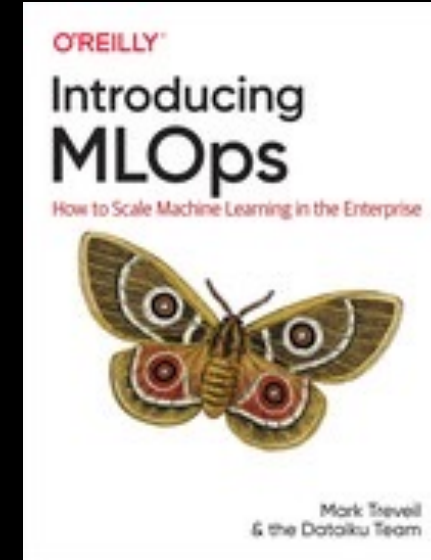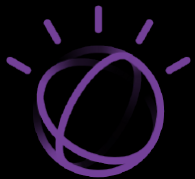
https://www.ibm.com/training/collection/trustworthyai

Q&A

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