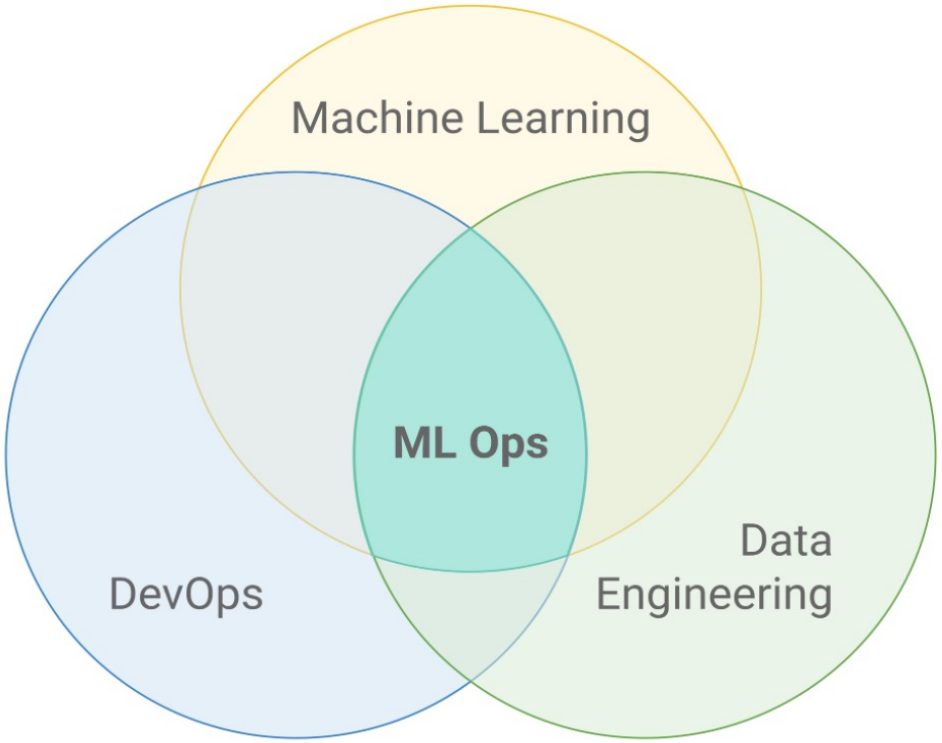
2 Value of MLOps

We need MLOps



ML systems are complex

- Models don’t last forever
- Many teams need to collaborate
- ML systems change with data
- Need to monitor many aspects

MLOps is growing

Forbes: by 2025 the MLOps business will grow to $4 billion

Not a software solution

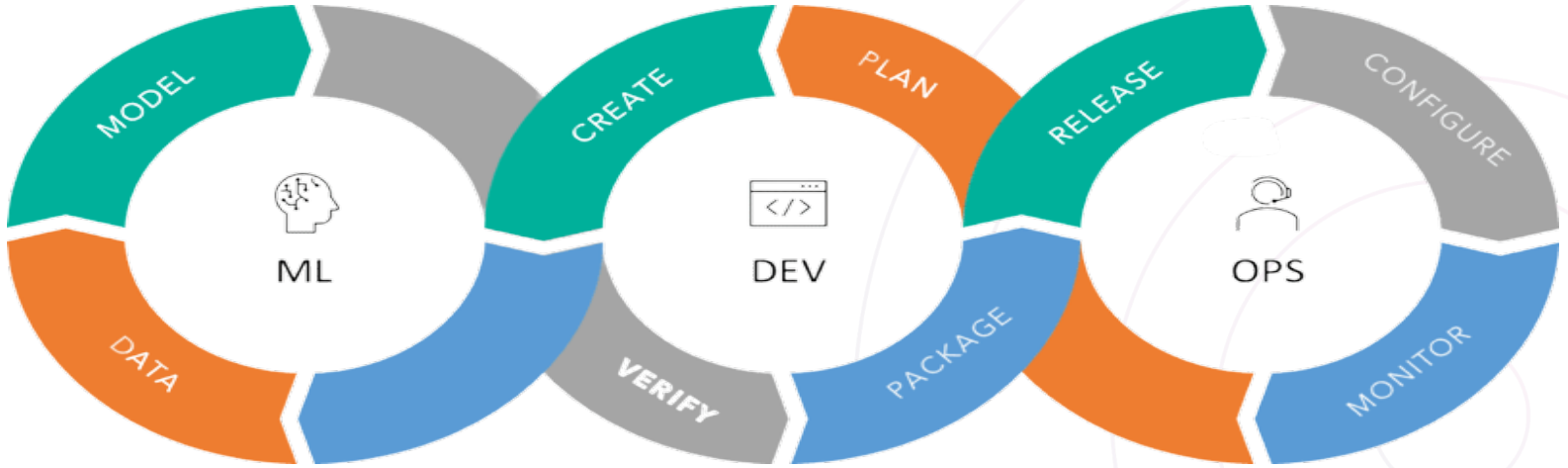
MLOps is not any particular software solution but:

Tools + Best Practices

Focus on:

- Speed up innovation through experimentation
- Create reproductible workflows
- Streamline the deployment process
- Manage the complete ML project lifecycle

Speeding up innovation



How:

- Brings all development and operational teams together
- Focuses on incremental improvements in development
- Uses monitoring validation and management systems to check progress

Reproductible workflows

Why do we need it?

- Reduce variability across iterations
- Resiliency to failure
- Smart copy

How do we achieve it?

- Focus on traceability
- Enforce the use of abstractions (e.g. pipelines)
- Track resources (data and models)

Streamline deployment

CI/CD is your friend

- MLOps enforces the good use of CI/CD principles
- Continuous and traceable improvement/changes

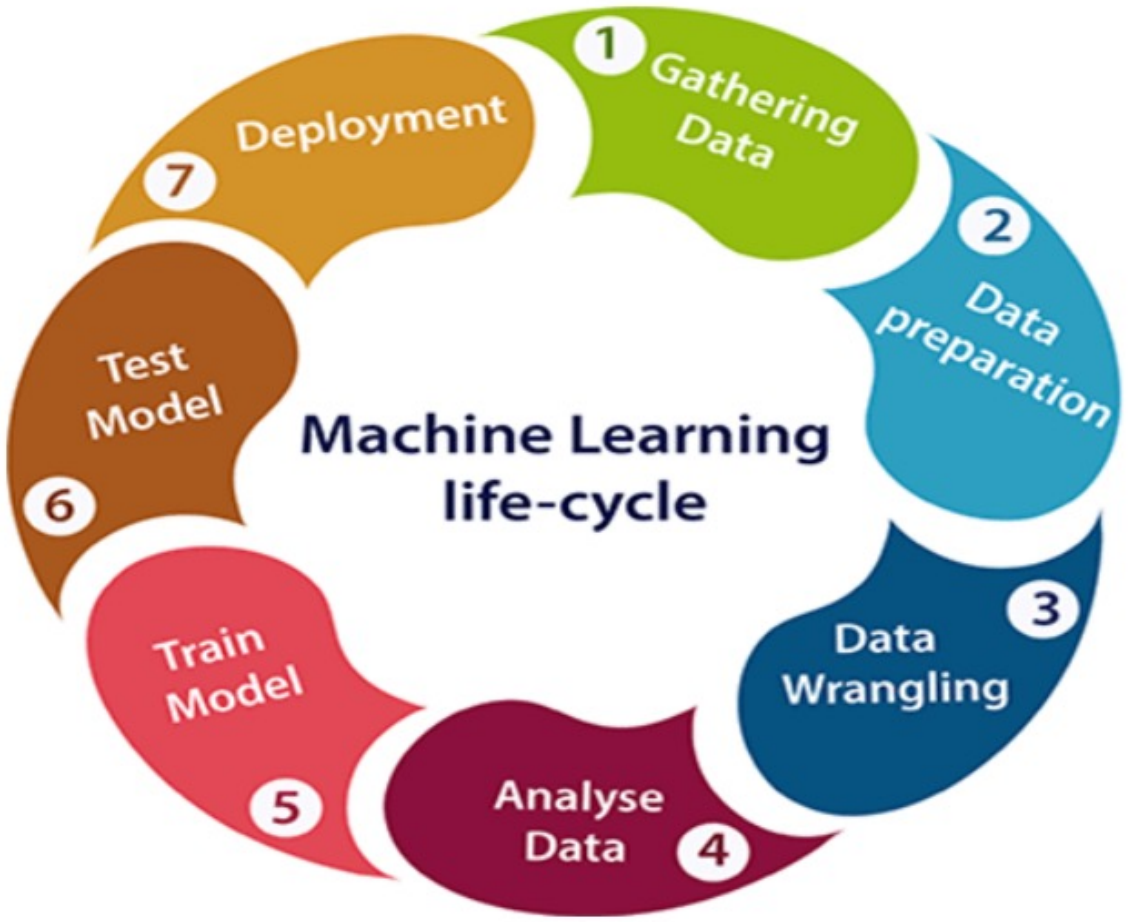
Manage infrastructure

- MLOps also aims to manage the infrastructure
- Enforces scalability and portability

Manage Configurations

- Abstracts configurations
- Making changes in a small configuration does not imply refactoring

Manage model lifecycle



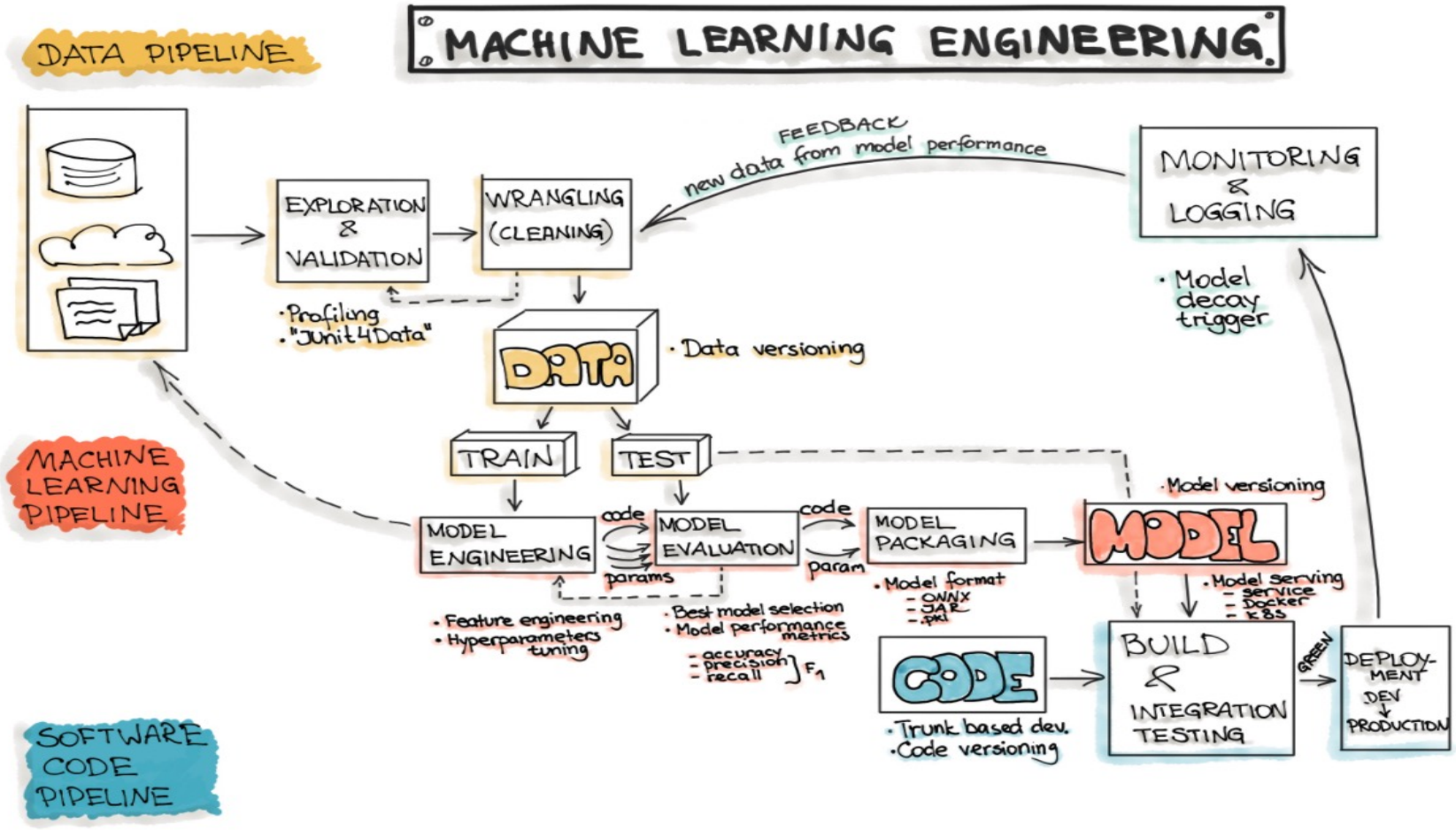
The picture is pretty, however

- In reality this order is often broken
- Each step can be complex

MLOps to the rescue

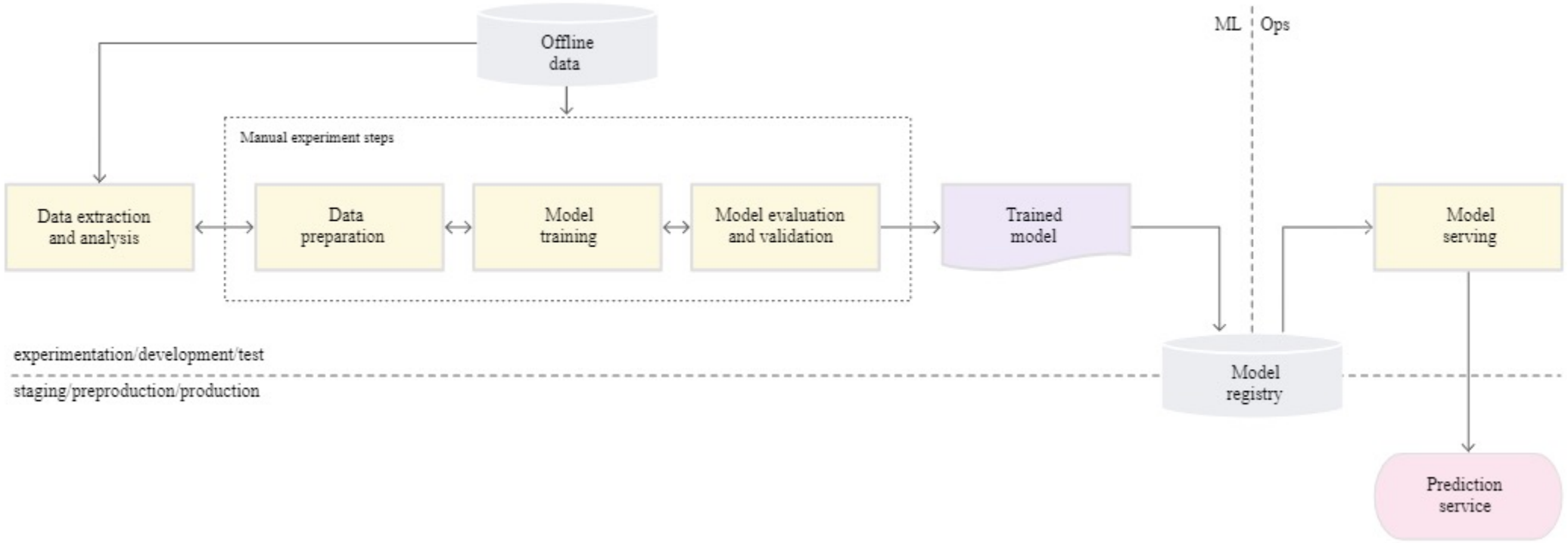
- Automate and manage the workflow
- Experiment tracking
- Guidelines for cross-functional teams
- Integrate experimentation with deployment

Manage the project lifecycle



But is it really necessary

I have a manual process that looks like this



Google - CD and automation pipelines in ML

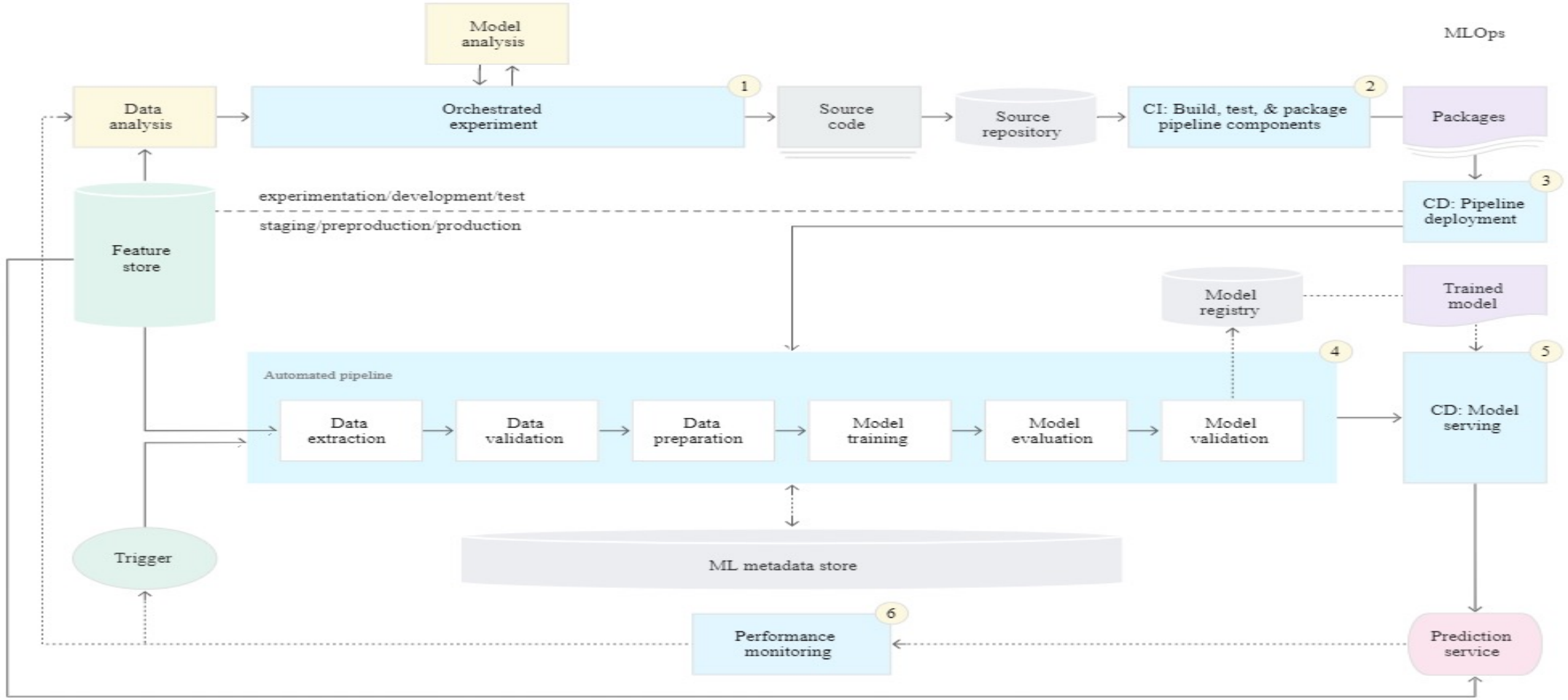
Even if you do

Even if:

- You have very competent data scientists
- You have a very solid IT department
- They know how to work well together
- They are able to automate model predictions
- And …..

You will still need a permanent reproducible record of what happened at every single step + processes to maintain and monitor your ML system

Mature framework



Google - CD and automation pipelines in ML

Reduce technical debt

MLOps main goal is to reduce technical debt

Some of the question posed by **MLOps**?

- How easily can a new algorithmic approach be tested at full scale?
- What is the transitive closure of all data dependencies?
- How precisely can the impact of a new change to the system be measured?
- Does improving one model or signal degrade others?
- How quickly can new members of the team be brought up to speed?

Address regulatory challenges

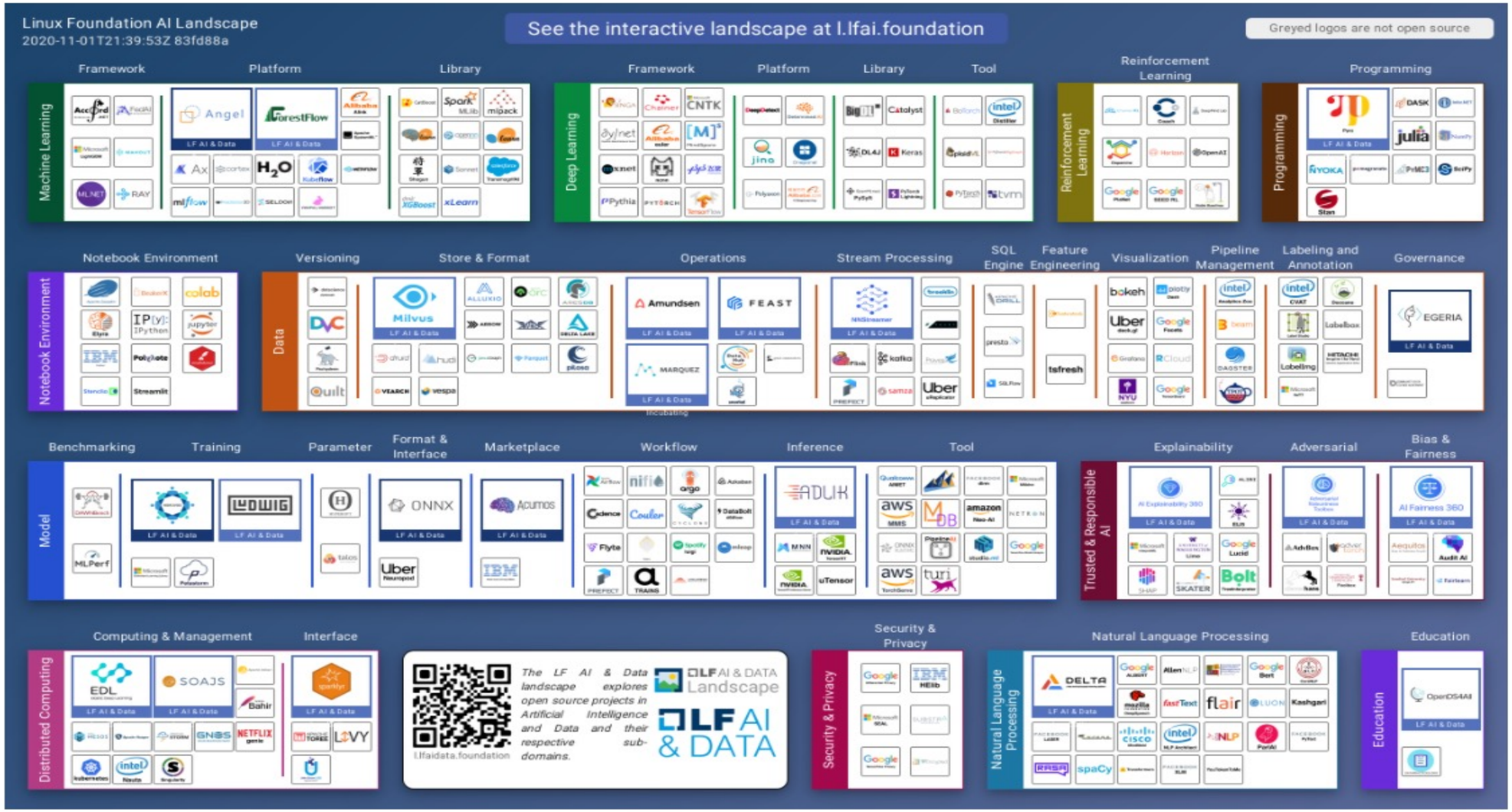
Regulation is increasing

- GDPR
- European legal framework for AI

MLOps related to regulation?

MLOps puts the operations team at the forefront of regulation and best practices

MLOps has a price



Institue for ethical AI