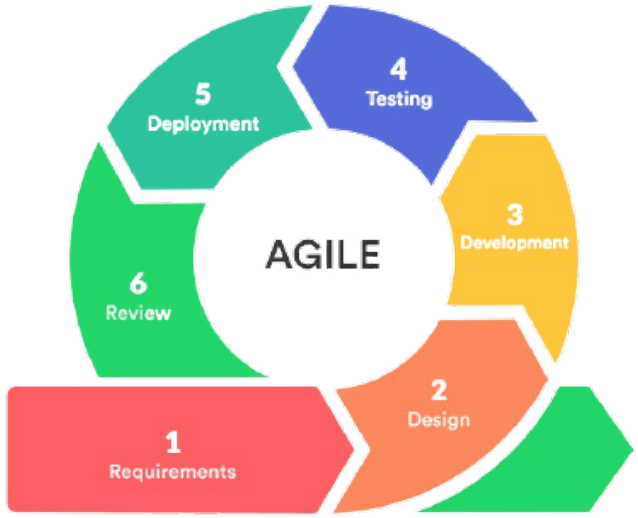
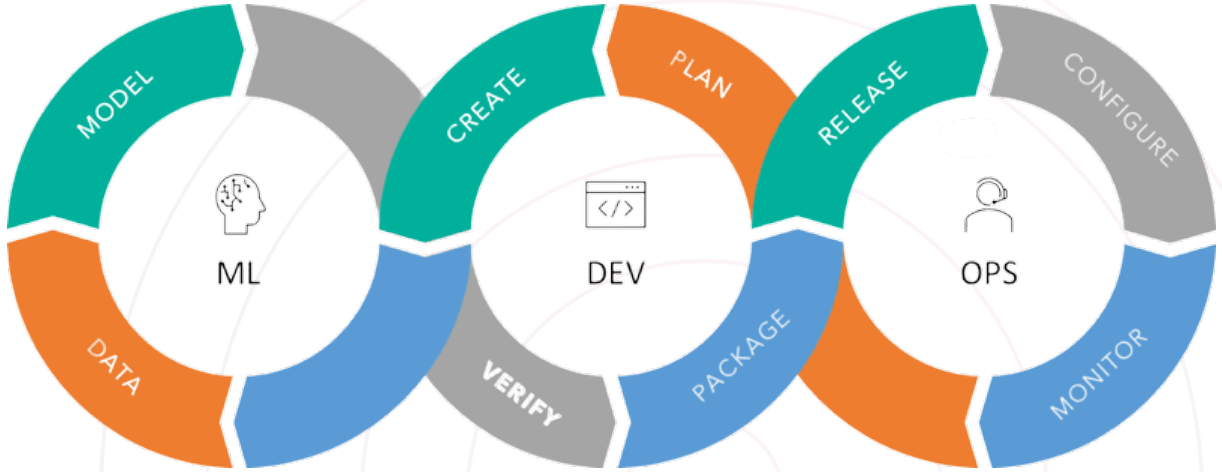
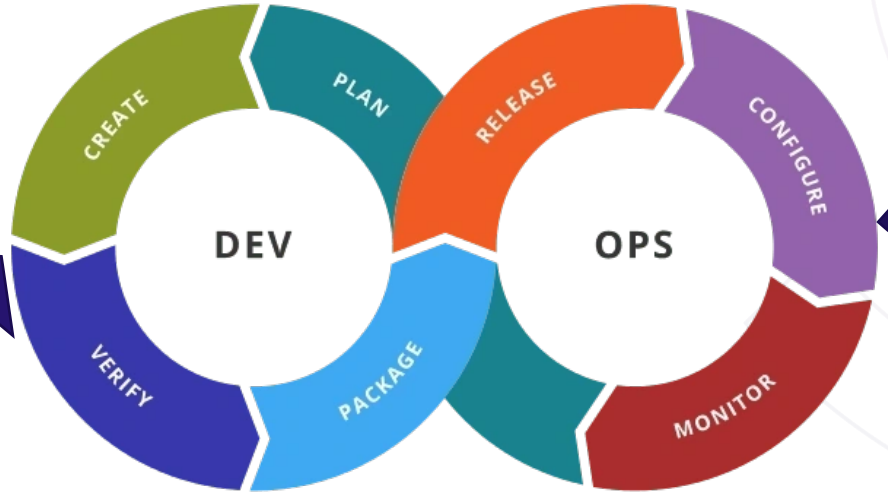
1 Introducing MLOps

The road so far







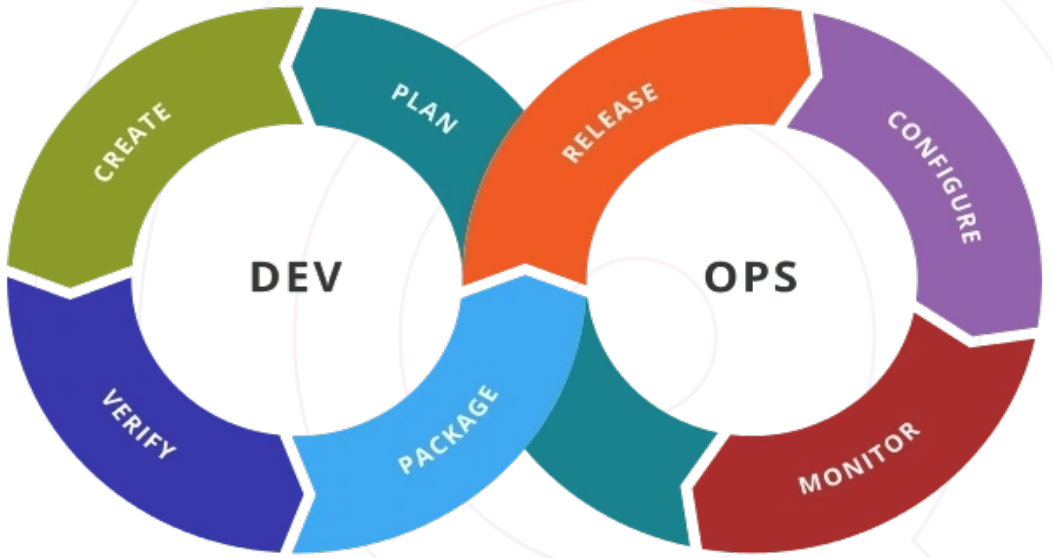
DevOps

What is DevOps?

Tools and best practices to improve software development process and operations

Advantages:

- Speed
- Rapid Delivery
- Reliability
- Improved collaboration
- Security



Continuous improvement

CI/CD Deliver faster and better

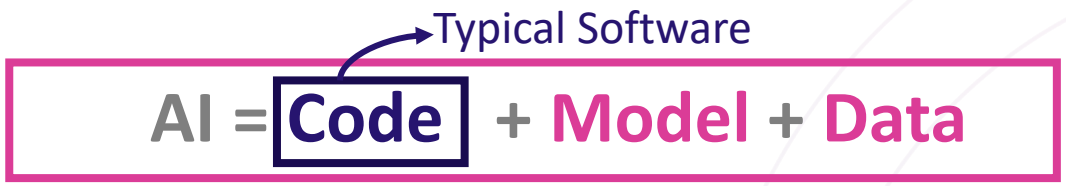
Continuous Integration

- Allows small incremental improvements
- Automates the build, test, and packaging of applications in a reliable and repeatable way.
- Streamlines code changes
- Set of practices performed as developers are writing code

Continuous Delivery

- Automated delivery of code
- Allows for continuous deployment
- Set of practices performed after the code is completed

Is DevOps enough?



Typical software developer's flow

Save code changes → Refresh → Changed

Typical data scientist's flow

Save code change → Spin a cluster → Deploy code
→ Transfer Data → Model Training

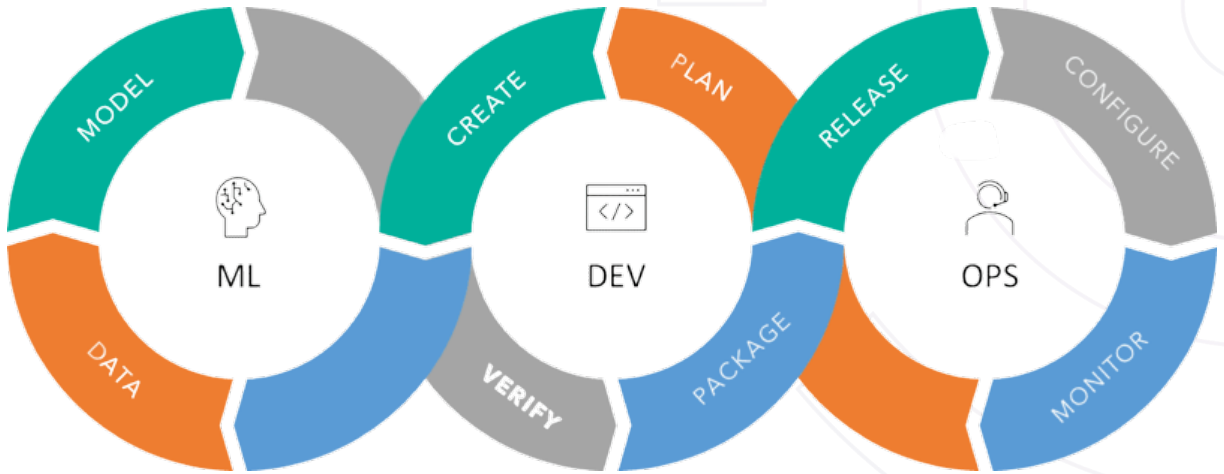
Why is DevOps not enough?

Traditional software	Machine learning systems
Only Code	Code + Data
Easy to get feedback	Code change → retrain model
Code is relatively static	Models learn constantly

Enters MLOps

Machine Learning Operations (MLOps)

Practice that aims to make developing and maintenance of machine learning systems in production smooth and efficient, augmenting their long-term value while reducing the risk associated it with it.



MLOps 4 pillars

Collaborative

Reproducible

Scalable

Continuous

Collaborative

Collaborative ML

- MLOps ensures that all steps in the ML system are transparent
- MLOPs eases collaboration through all the project life cycle

Visible ✓ ***Auditable*** ✓

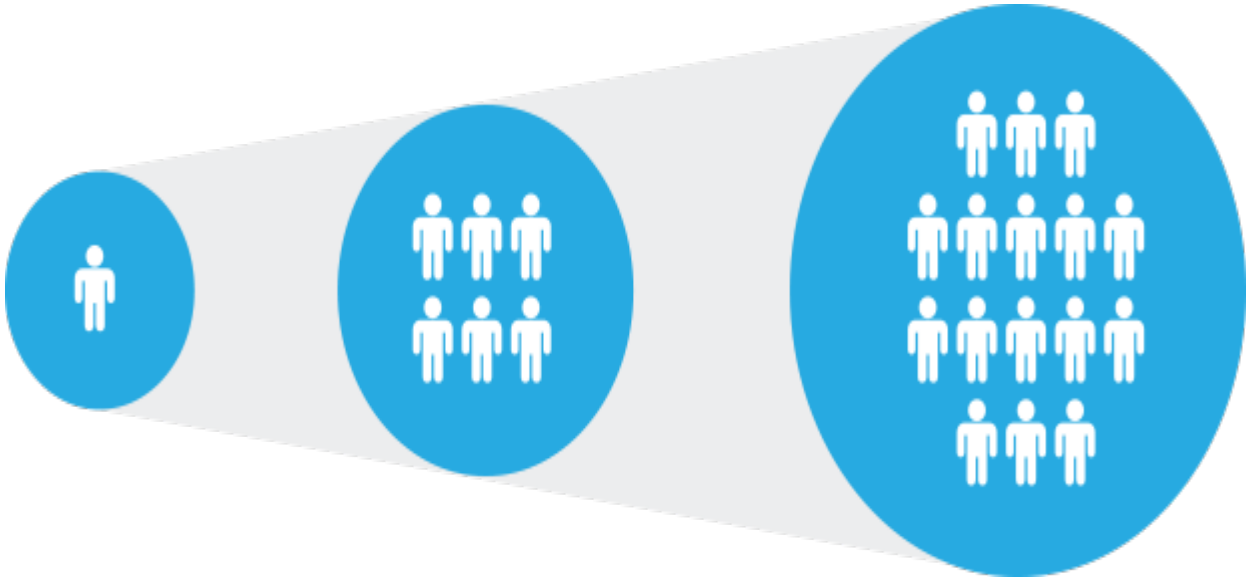
Reproducible

Reproducible ML

- MLOps enforces storing of all artifacts
- Versioning more than code: data, models, meta data, etc.

Process ≠ Experiment

Scalable

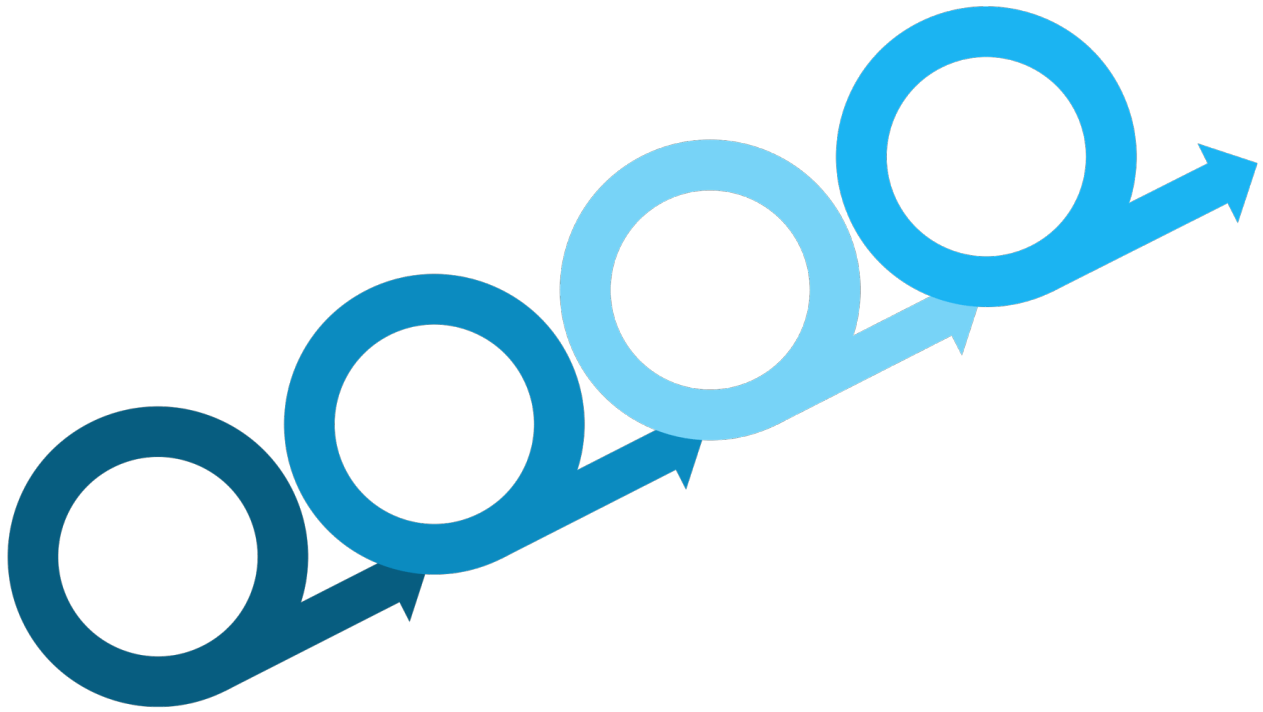


Scalable ML

- MLOps eases expansion of infrastructure to scale projects
- Volumes of data can grow quickly, so the set up should grow naturally

Natural growth

Continuous



Continuous ML

- Ensure a CI/CD process is central to MLOps
- ML should be thought as a continuous process
- Retraining models should be effortless

Ad-hoc < Automated