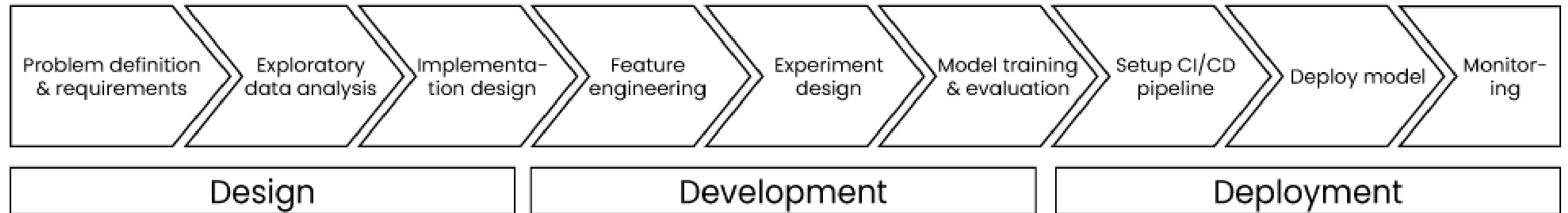# What is MLOps?

MLOPS CONCEPTS
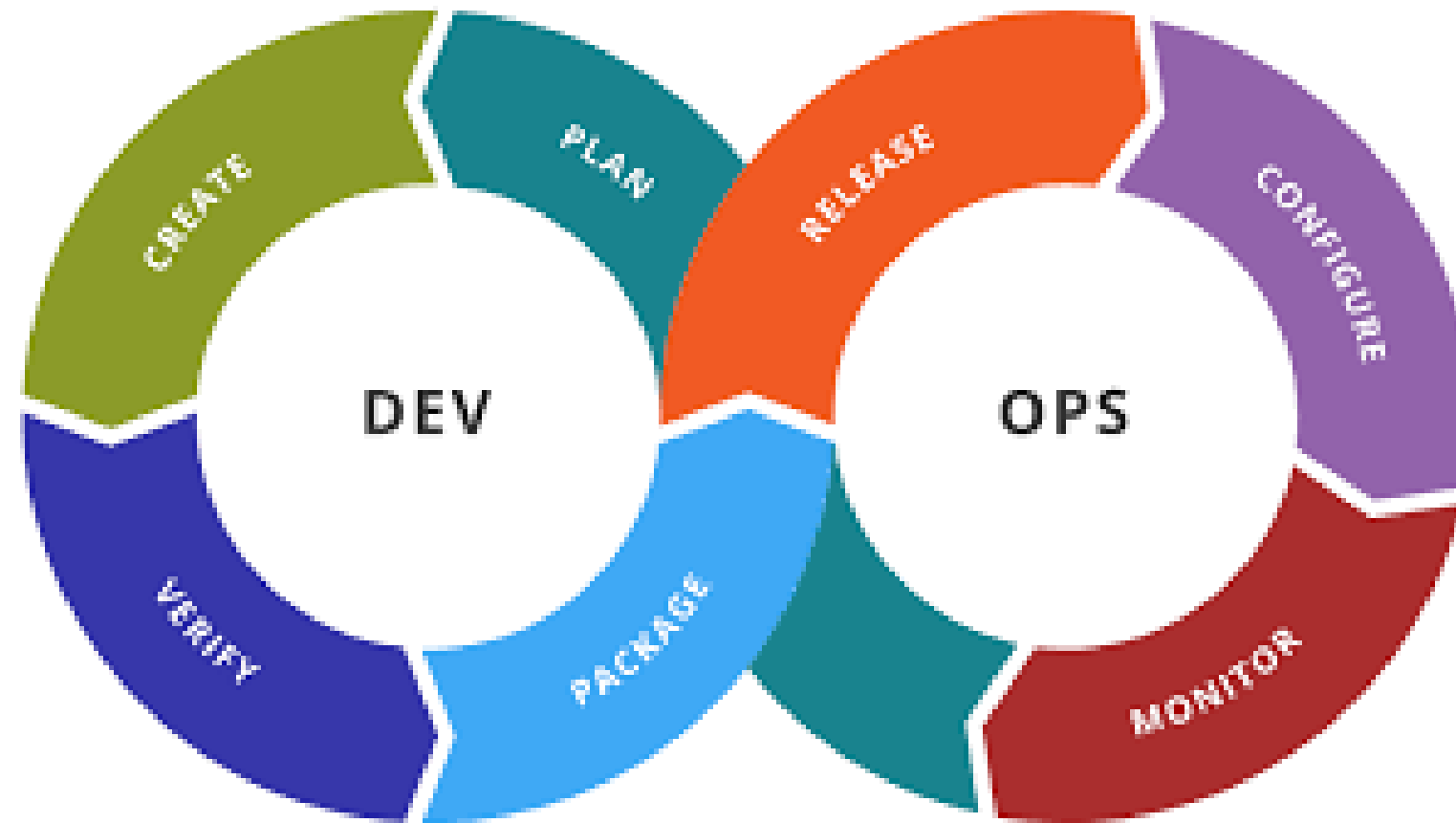
Folkert Stijnman
ML Engineer

Machine Learning Operations

*...is the set of practices to **design, deploy** and **maintain** machine learning in production **continuously, reliably,** and **efficiently.***

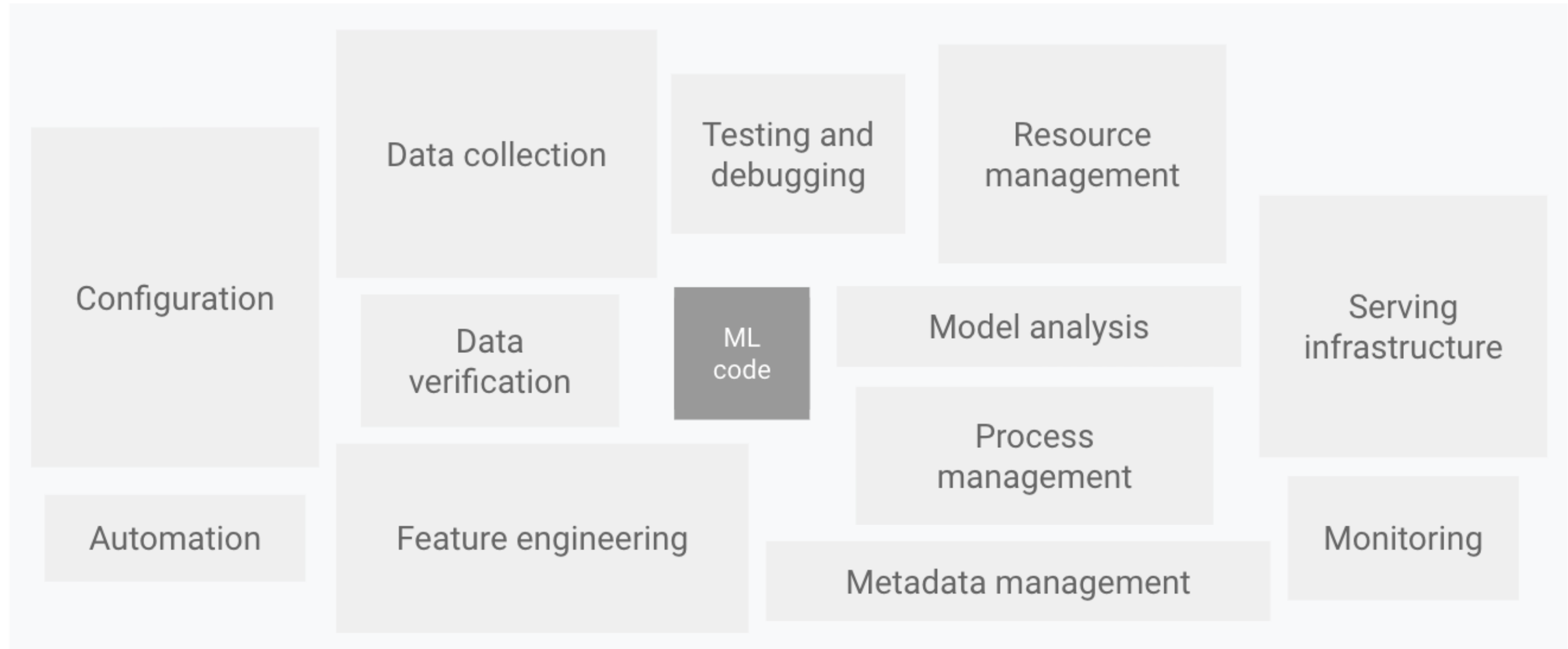- Focus on machine learning '*in production*'
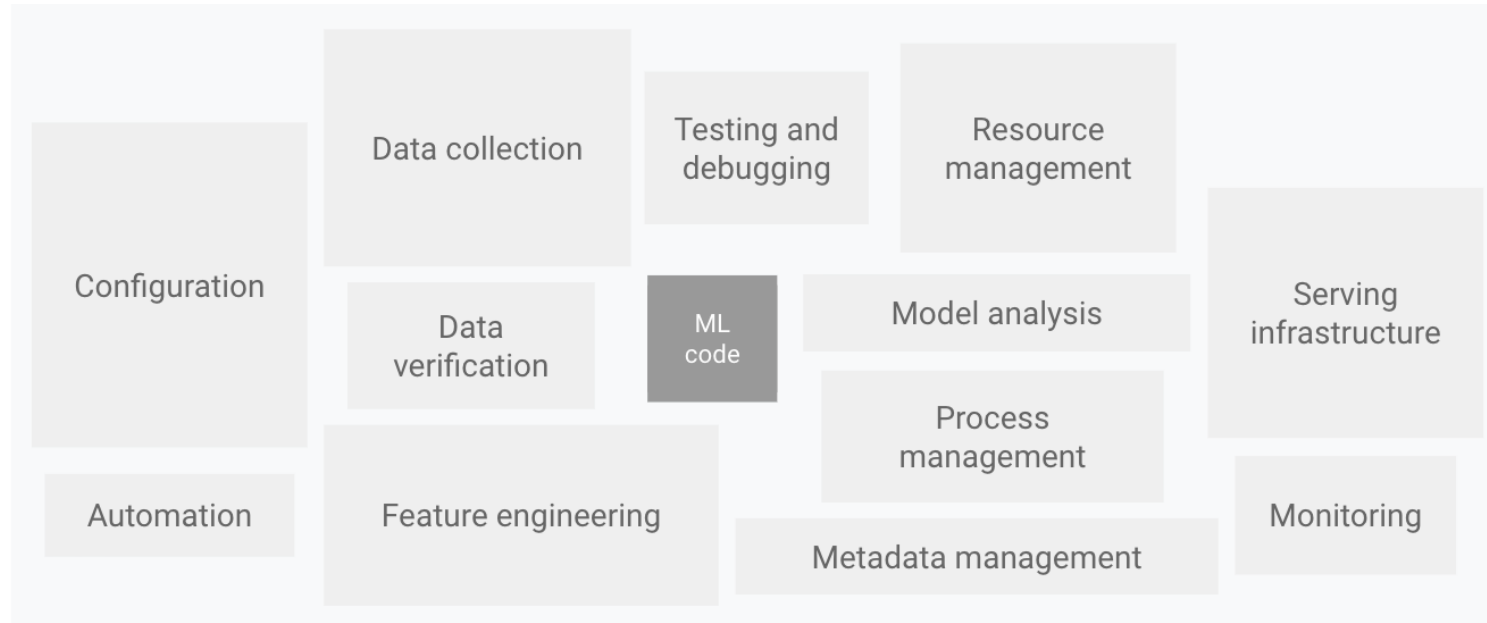
- The full machine learning lifecycle

Problem definition & requirements	Exploratory data analysis	Implementa- tion design	Feature engineering	Experiment design	Model training & evaluation	Setup CI/CD pipeline	Deploy model	Monitor- ing

Design	Development	Deployment

The origin of MLOps

- Practices and tools to deliver software applications

- Development and Operations used to be separate

Why MLOps

Configuration

Data collection

Testing and debugging

Resource management

Data verification

ML code

Model analysis

Serving infrastructure

Automation

Feature engineering

Process management

Metadata management

Monitoring

Why MLOps

- Improved collaboration

- Automation of deployment

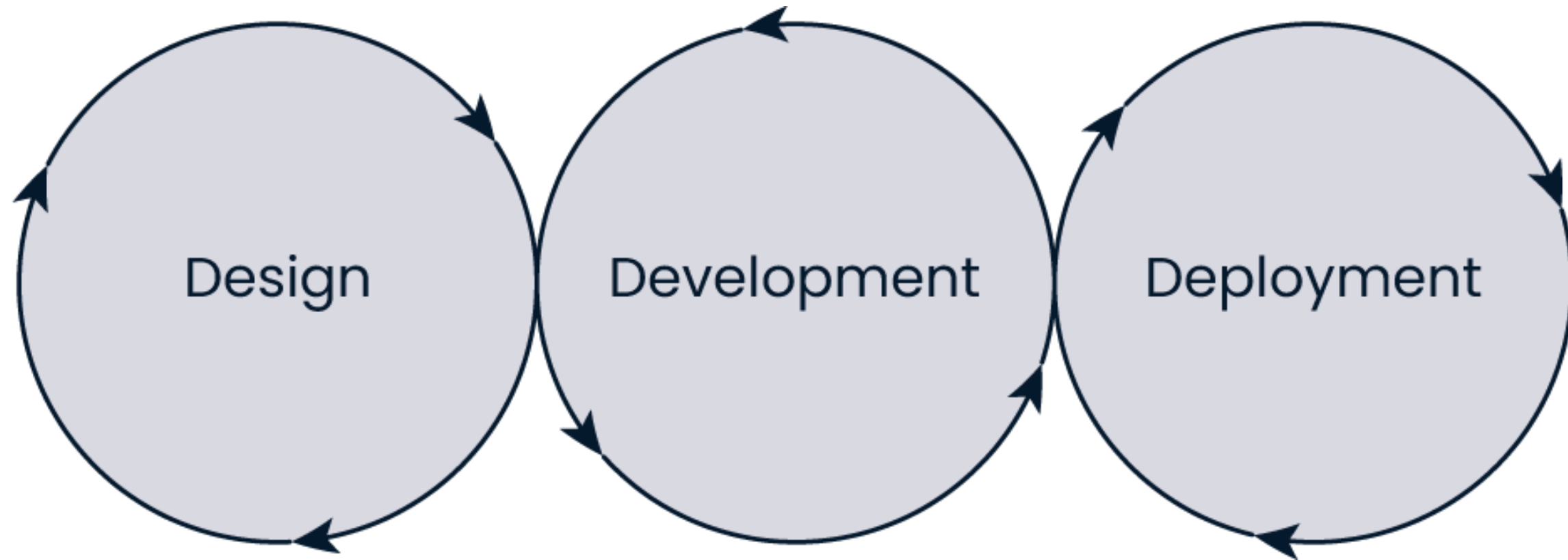- Monitoring of model performance

Let's practice!

MLOPS CONCEPTS
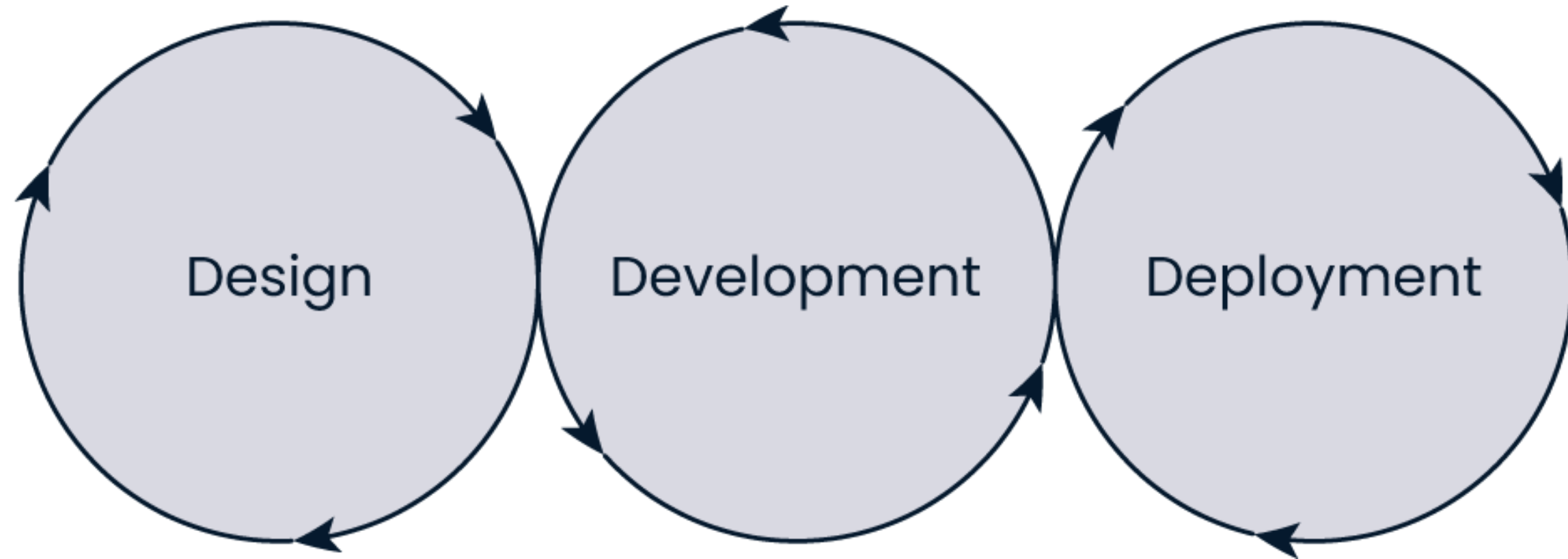
Different phases in MLOps

MLOPS CONCEPTS

Folkert Stijnman
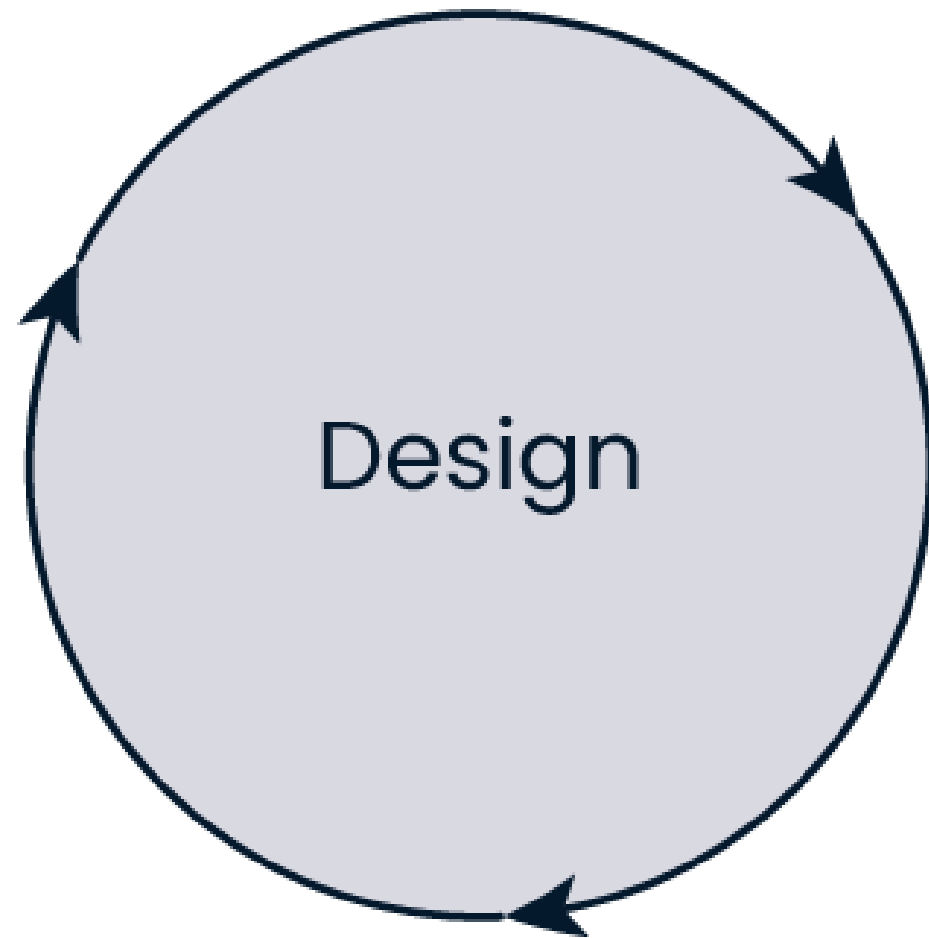ML Engineer

MLOps lifecycle

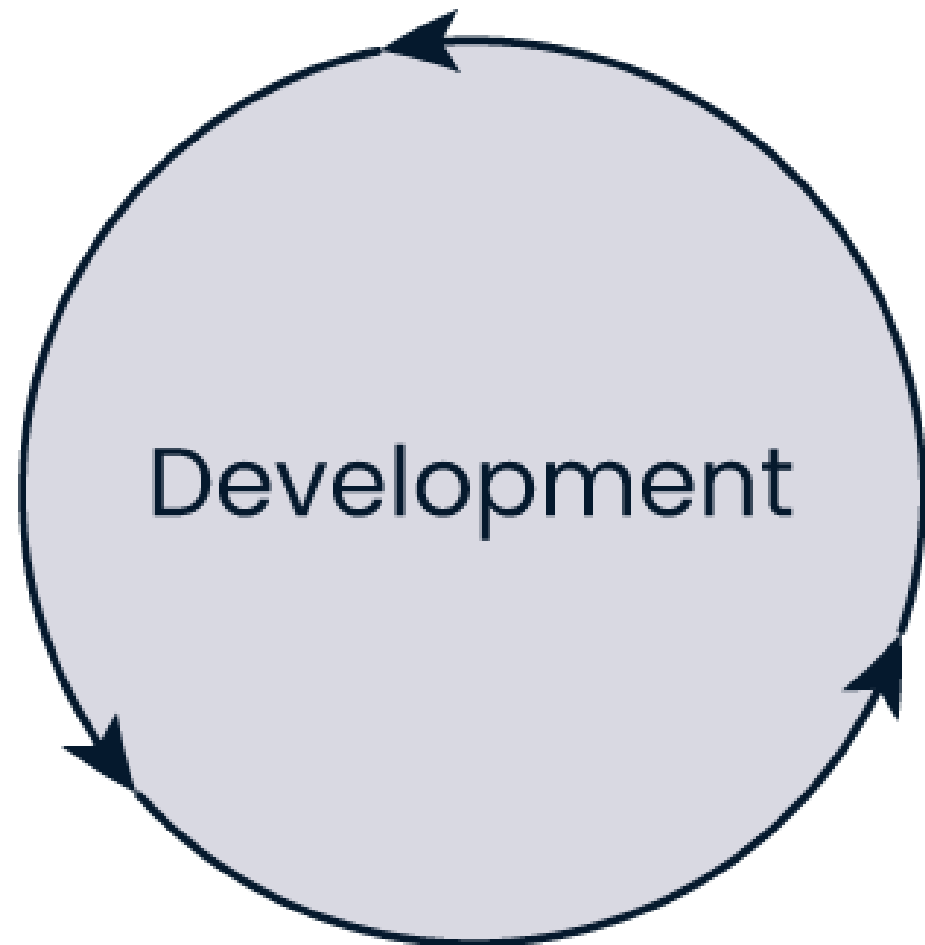# Why the machine learning lifecycle?

- Structures the ML process

- Defines key players at each stage

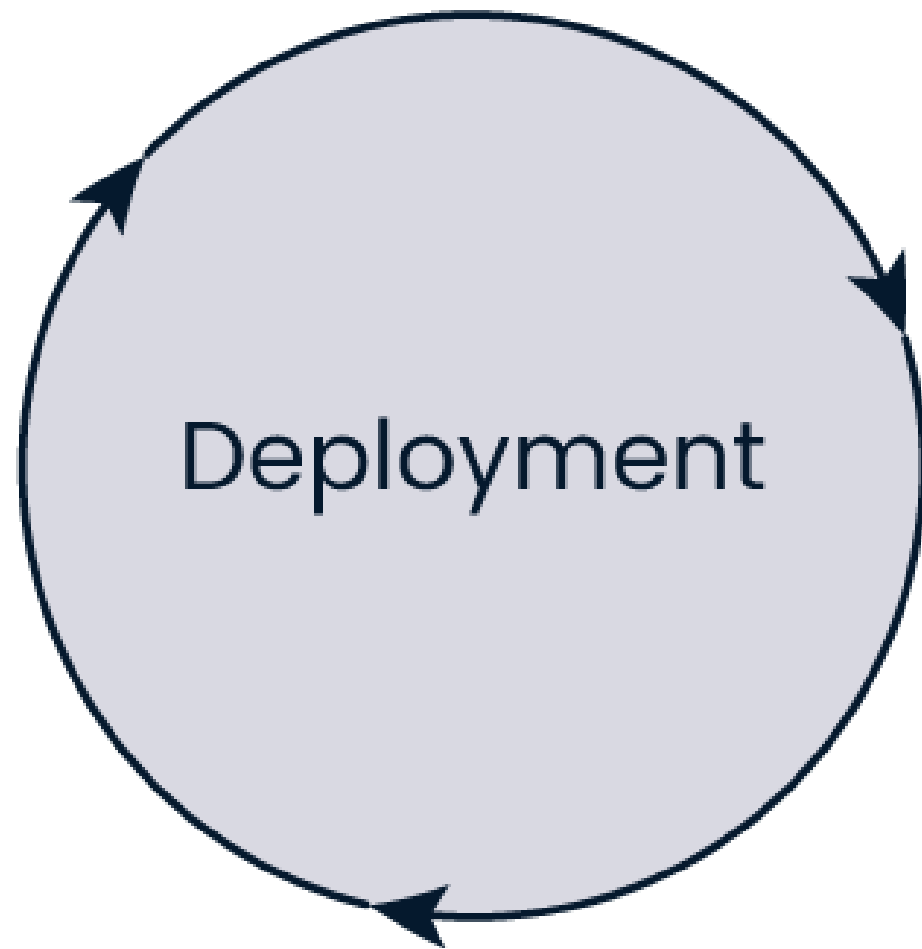- Toolkit for optimization

Design phase

- Context of the problem

- Added value

- Business requirements

- Key metrics

- Data processing
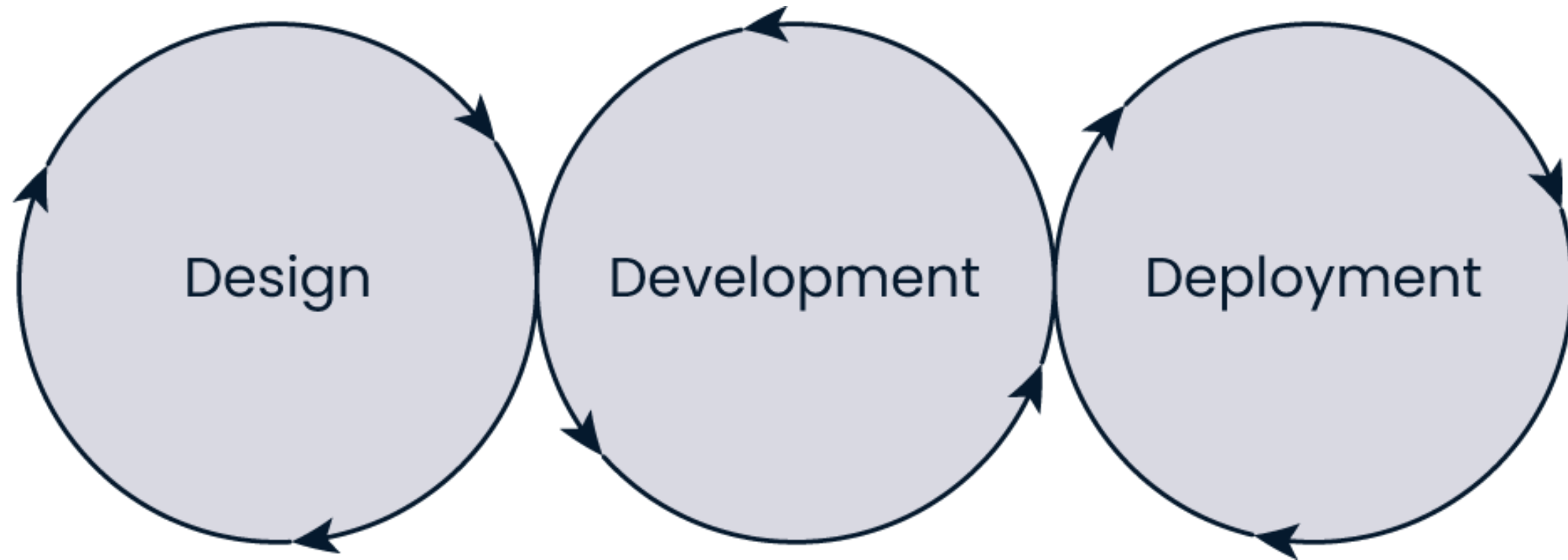
Development phase

Development

- Develop machine learning model

- Experiment with data, algorithms, and hyperparameters

- Model ready for deployment

Deployment phase

- Integrate the machine learning model in business

- Deploying the model in production

- Monitoring the performance

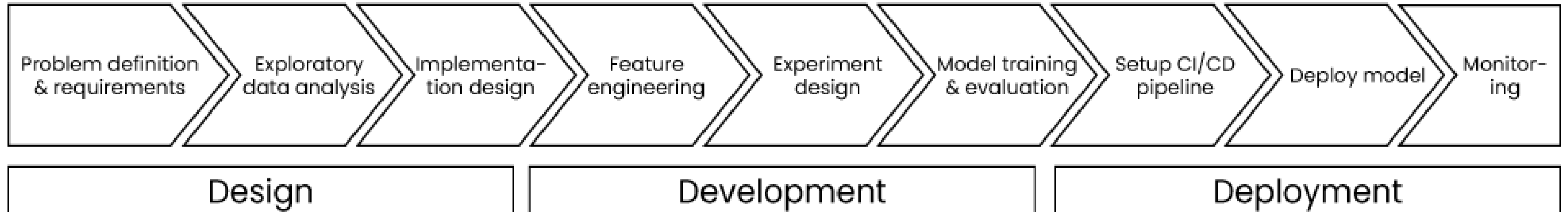# MLOps lifecycle

Let's practice!

MLOPS CONCEPTS

Roles in MLOps

MLOPS CONCEPTS

Folkert Stijnman
ML Engineer

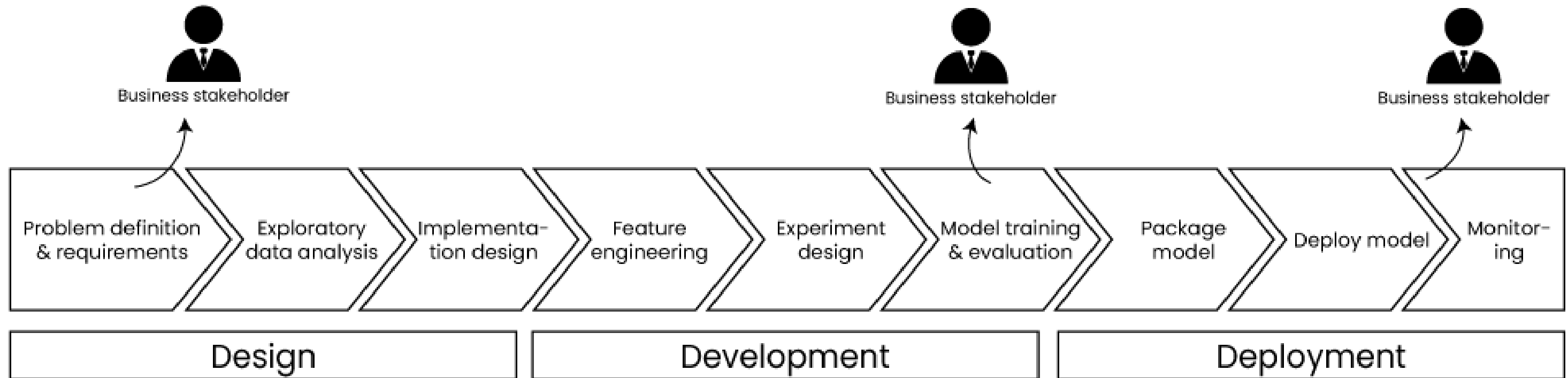# Machine learning lifecycle

- Business roles

- Technical roles

Business roles

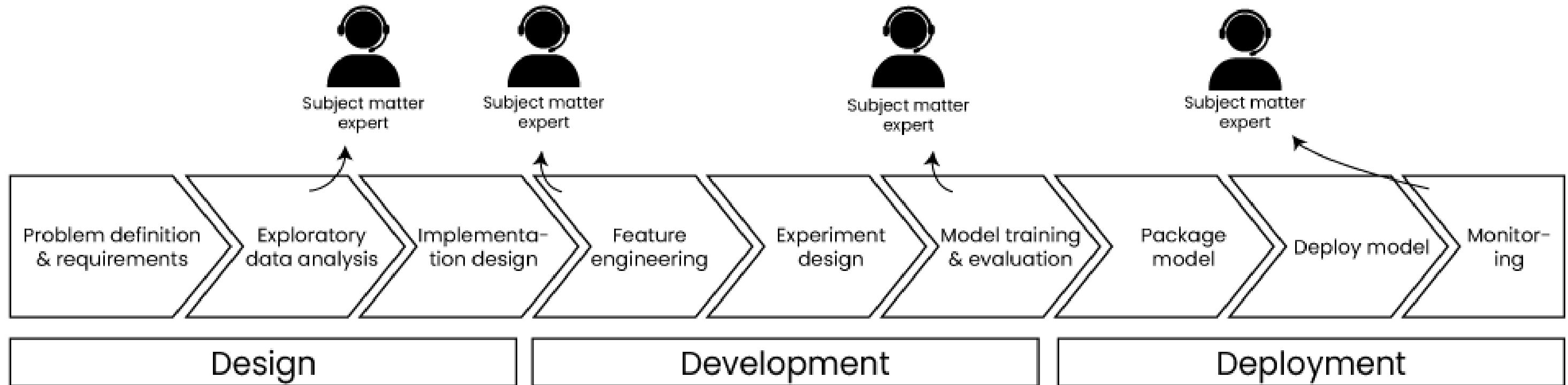- Business stakeholder

- Subject matter expert

Business roles: business stakeholder

- Budget decisions

- Vision of company
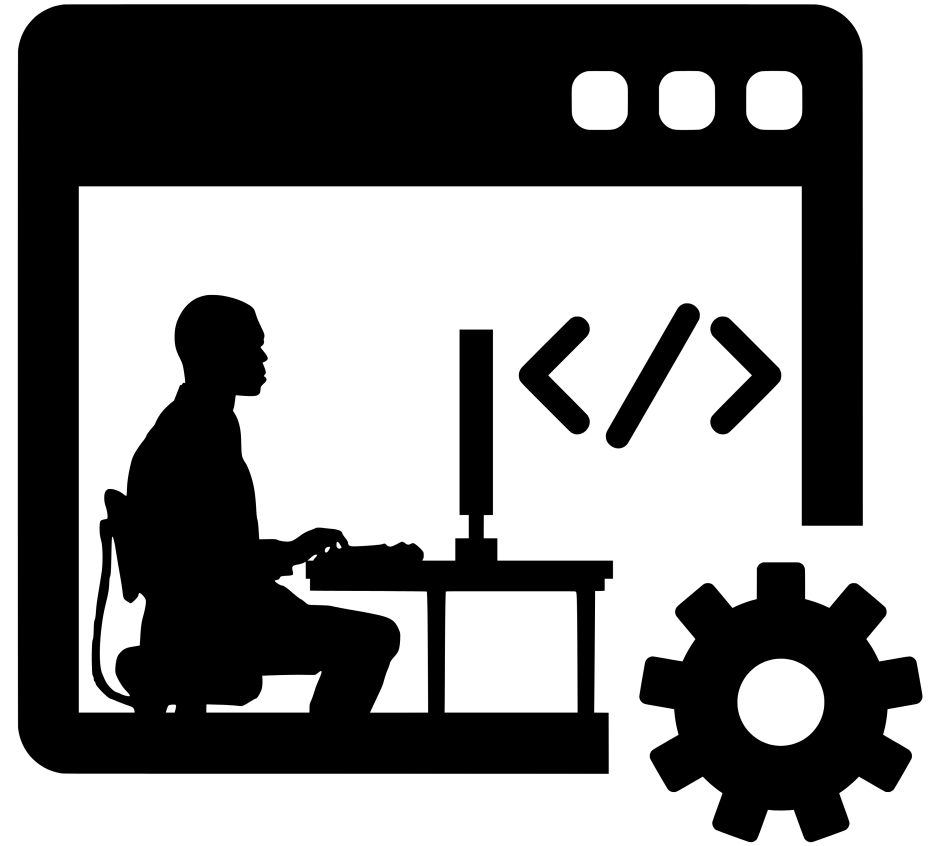
- Involved throughout the lifecycle

Business roles: subject matter expert
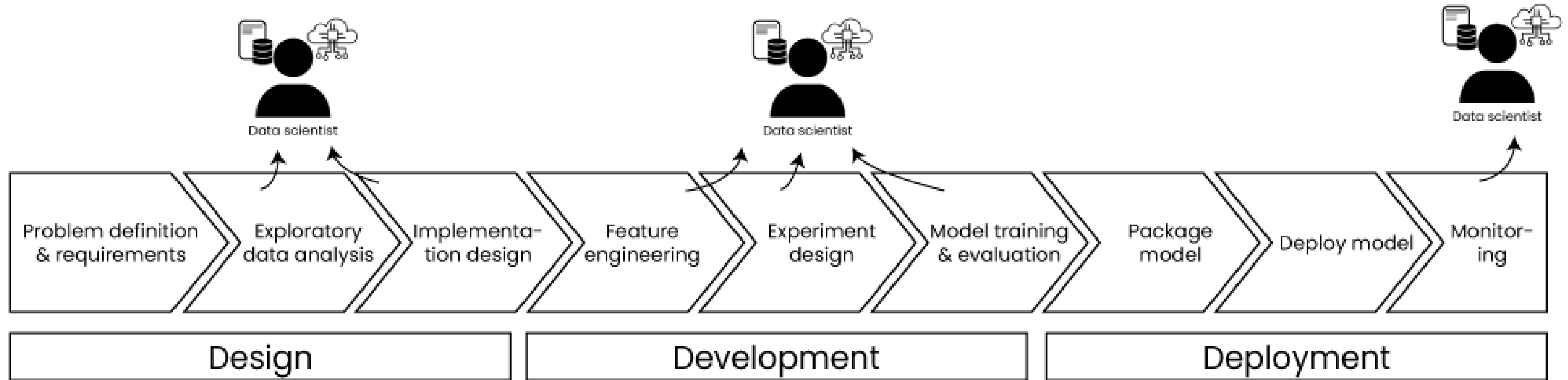

- Domain knowledge

- Involved throughout the lifecycle

- Interpret and validate data

Technical roles

- Data scientist
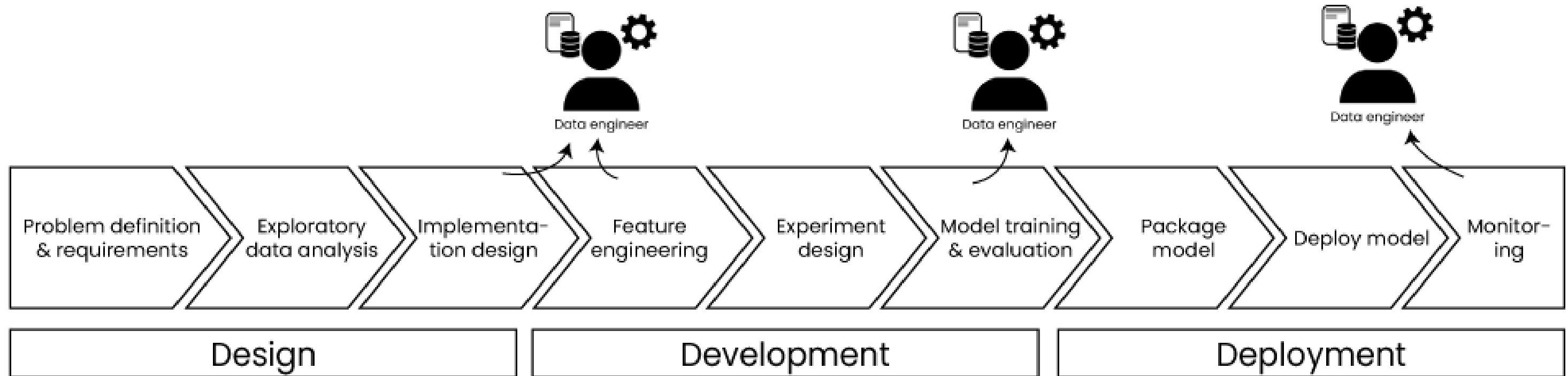
- Data engineer

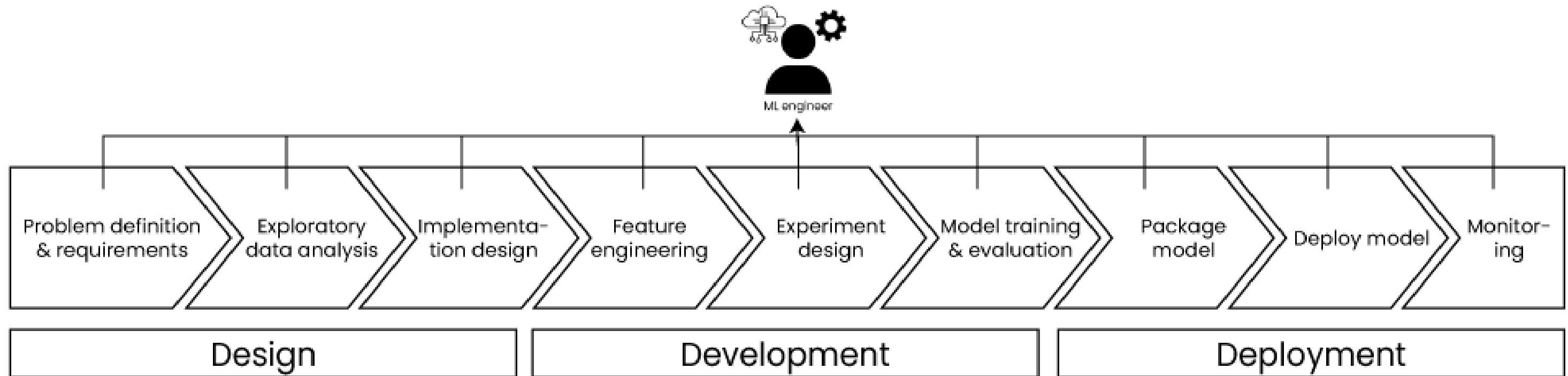- ML engineer

Technical roles: data scientist

- Data analysis

- Model training and evaluation

Technical roles: data engineer

- Collecting, storing, and processing data

- Check and maintain data quality

Technical roles: ML engineer

- Versatile role

- Specifically designed for complete machine learning lifecycle

Additional roles involved in ML

- Data analyst, developer, software engineer, backend engineer

- Responsbility of roles can vary depending on application of machine learning

- Startup is different from a large enterprise

Let's practice!

MLOPS CONCEPTS