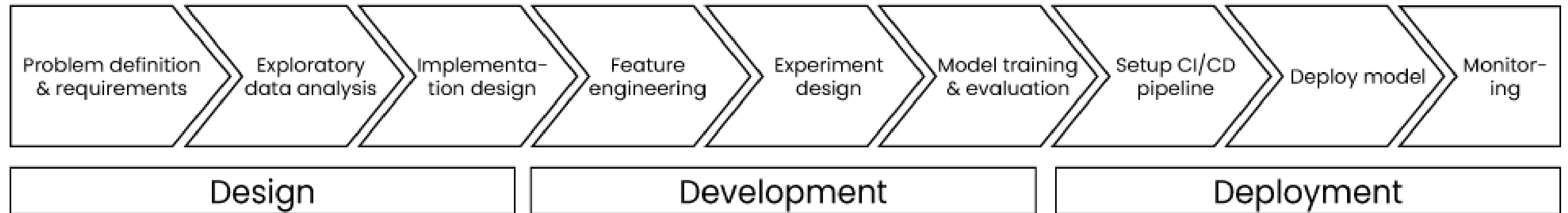# What is MLOps?

MLOPS CONCEPTS
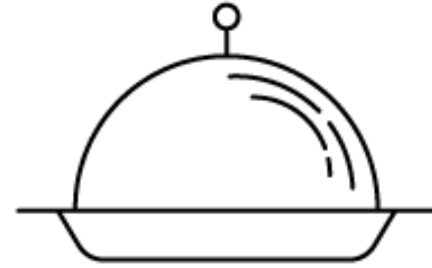
Folkert Stijnman
ML Engineer

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	Implementation design	Feature engineering	Experiment design	Model training & evaluation	Setup CI/CD pipeline	Deploy model	Monitoring

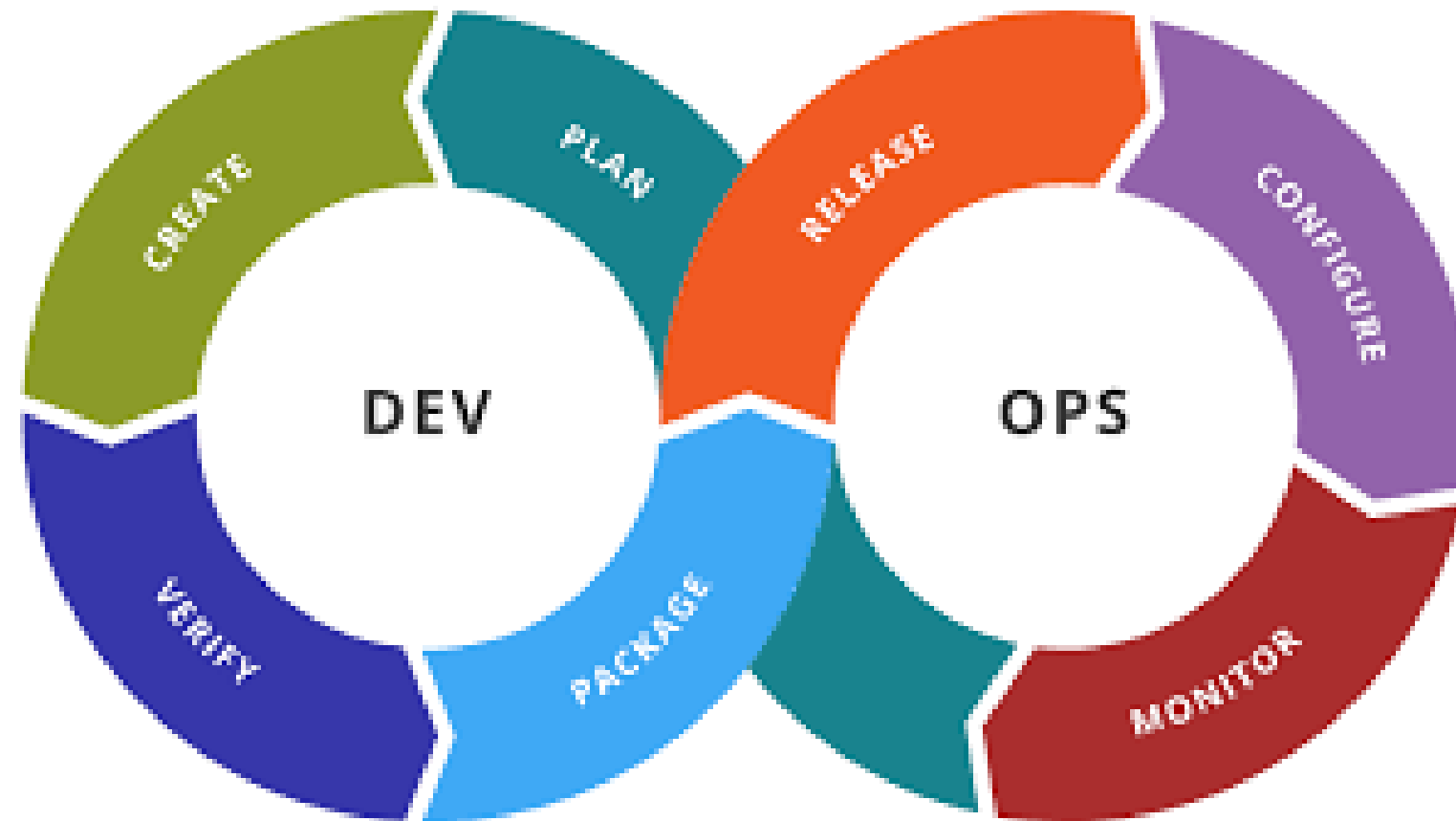| Design	Development	Deployment

Why MLOps

- Ingredients

- Guest taste

- People in service

- Kitchen equipment

- Business requirements and value

- Data

- Algorithm

- Computer

The origin of MLOps

- Practices and tools to deliver software applications

- Development and Operations used to be separate

- Answer to low velocity in 'traditional' software development

WhatOps?

- **ModelOps:** Model Operations
  - Is primarily focused on the machine learning model

- **DataOps:** Data Operations
  - Focuses on best practices in data quality and analytics

- **AIOps:** Artificial Intelligence for IT Operations
  - Focuses on using analytics, big data, and machine learning to solve IT issues without human assistance or intervention
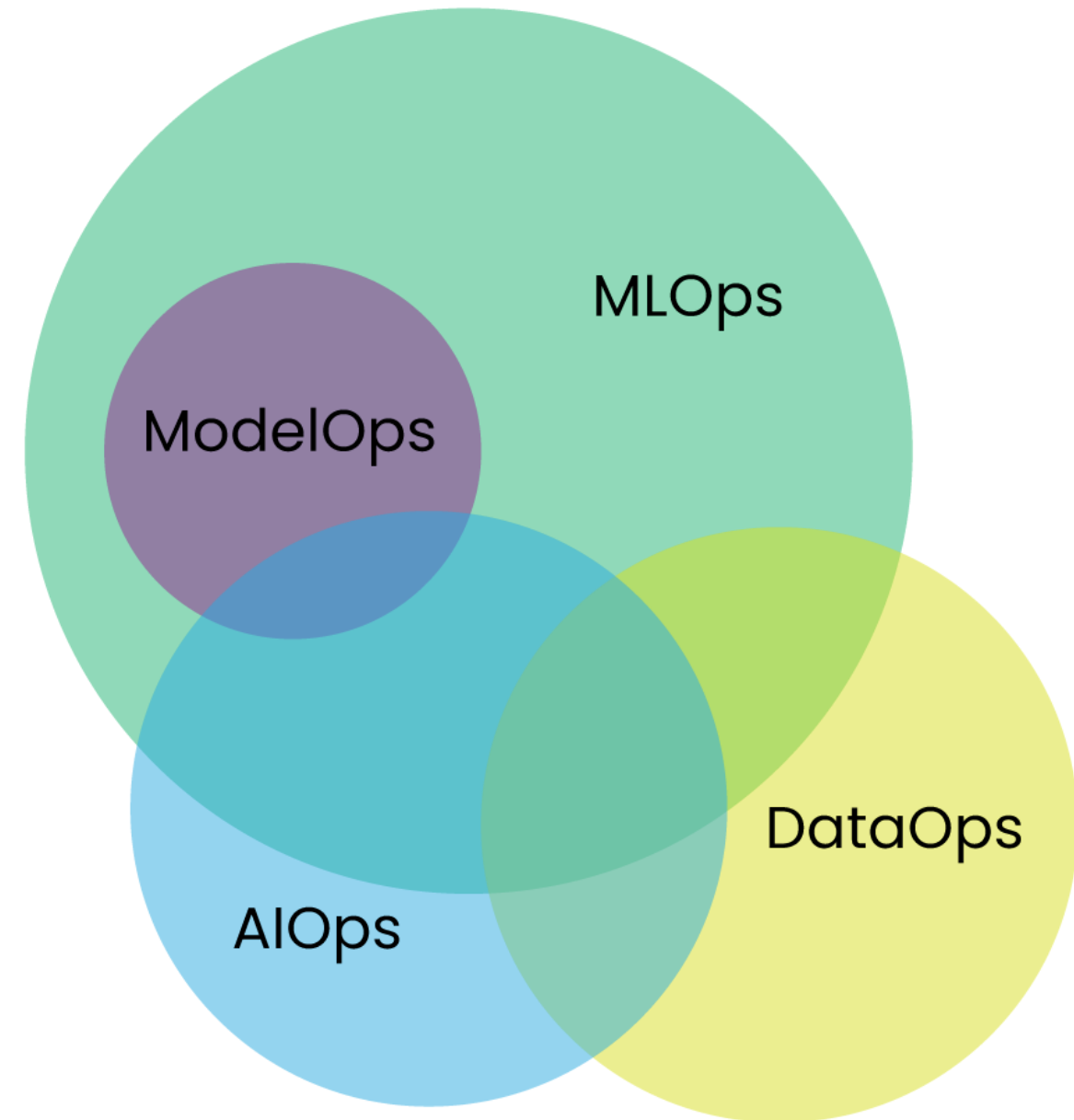
Benefits of MLOps

- Speed

- Reliability and security

- Improved collaboration

Let's practice!
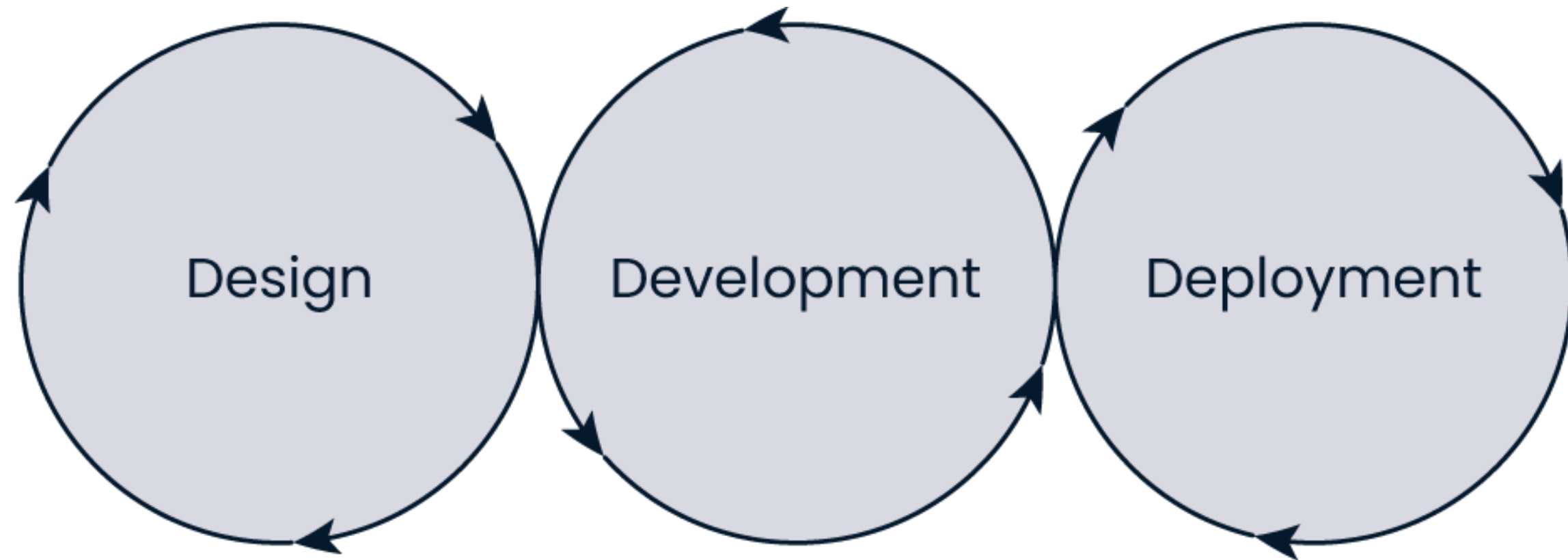
MLOPS CONCEPTS

Different phases in MLOps

MLOPS CONCEPTS
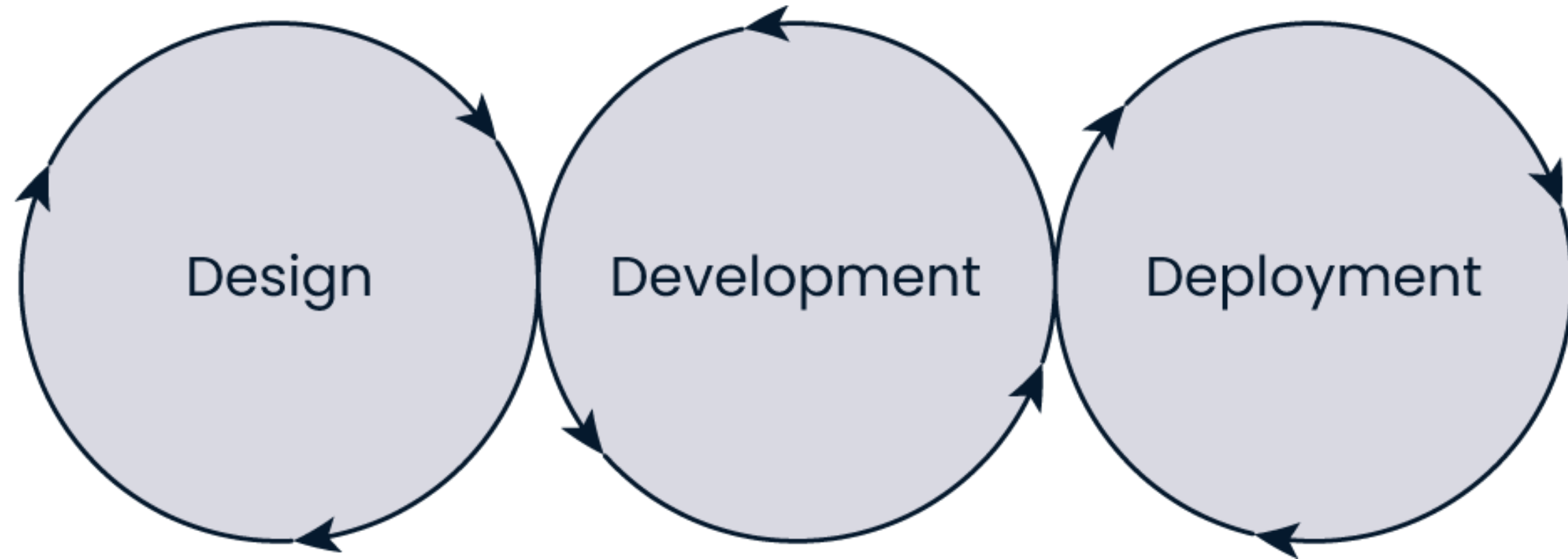
Folkert Stijnman

ML Engineer

MLOps lifecycle

- It is not uncommon to go back and forth between phases

- It is important to constantly evaluate with stakeholders whether the machine learning project should be continued
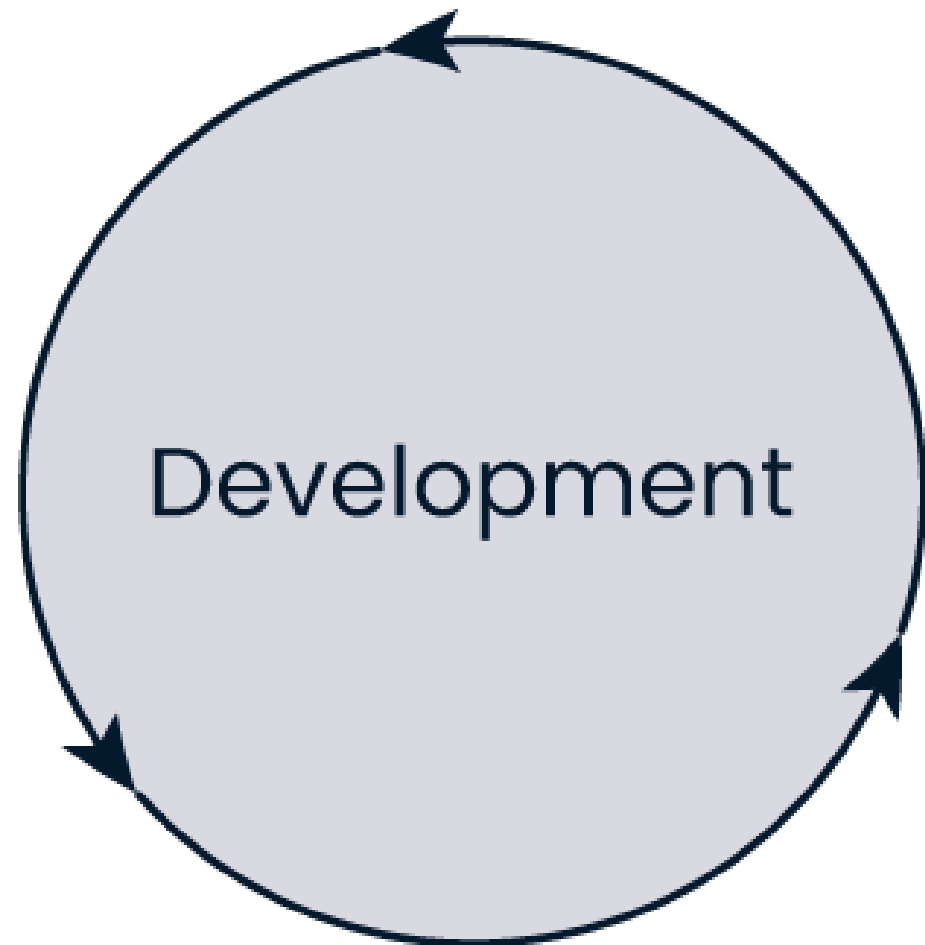
Why the machine learning lifecycle?

- Structure the process, don't 'just start'

- Defines who is required and when

- Applying practices and tools to specific phases
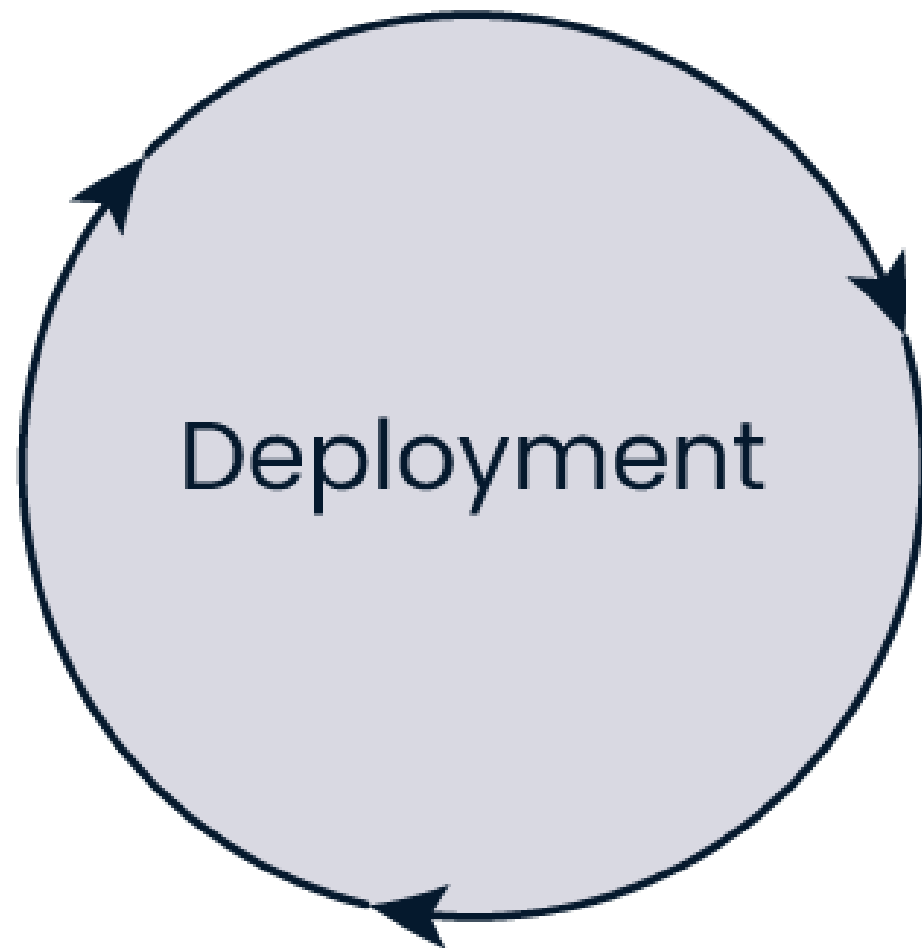
Design phase

Design
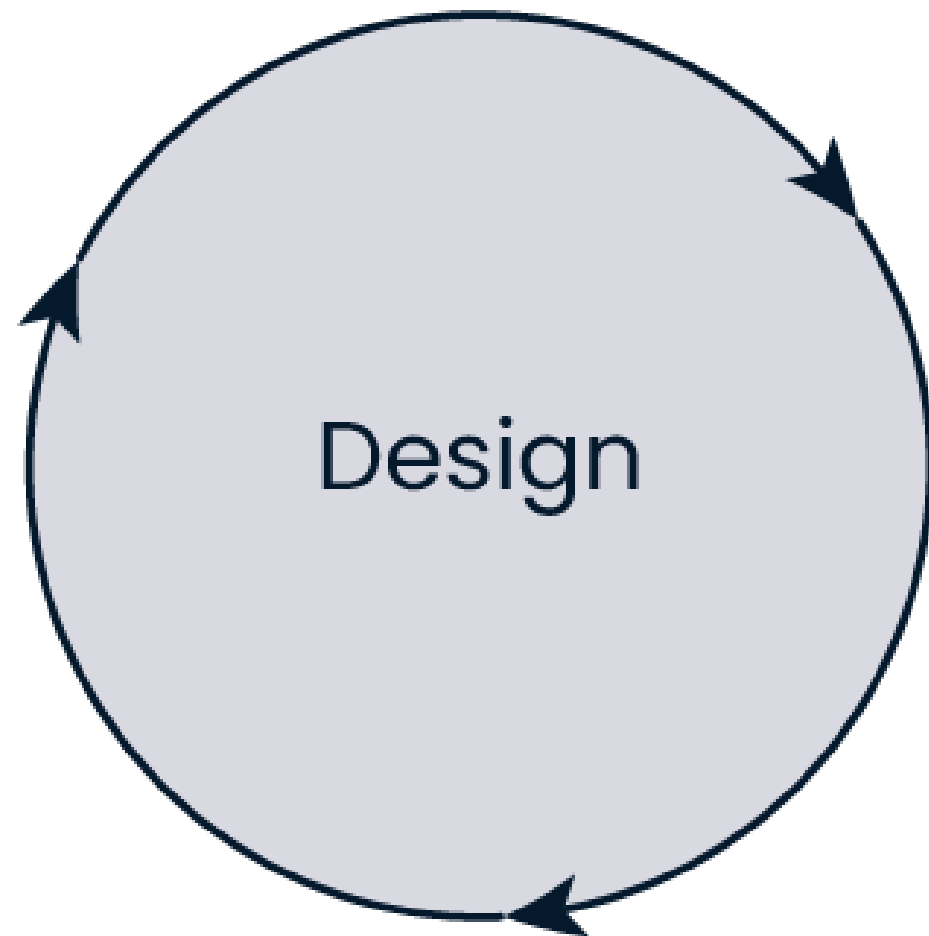
- Context of the problem

- Added value

- Business requirements

- Key metrics

- Data processing

Development phase

- Develop machine learning model

- Combination of 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

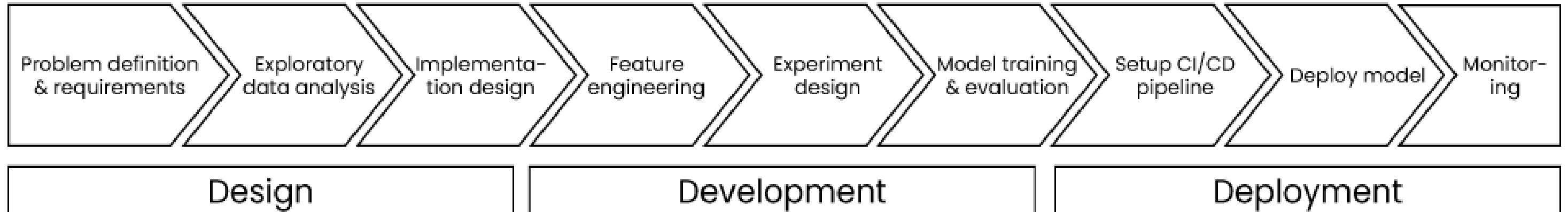# Let's practice!

MLOPS CONCEPTS

Roles in MLOps

MLOPS CONCEPTS

Folkert Stijnman
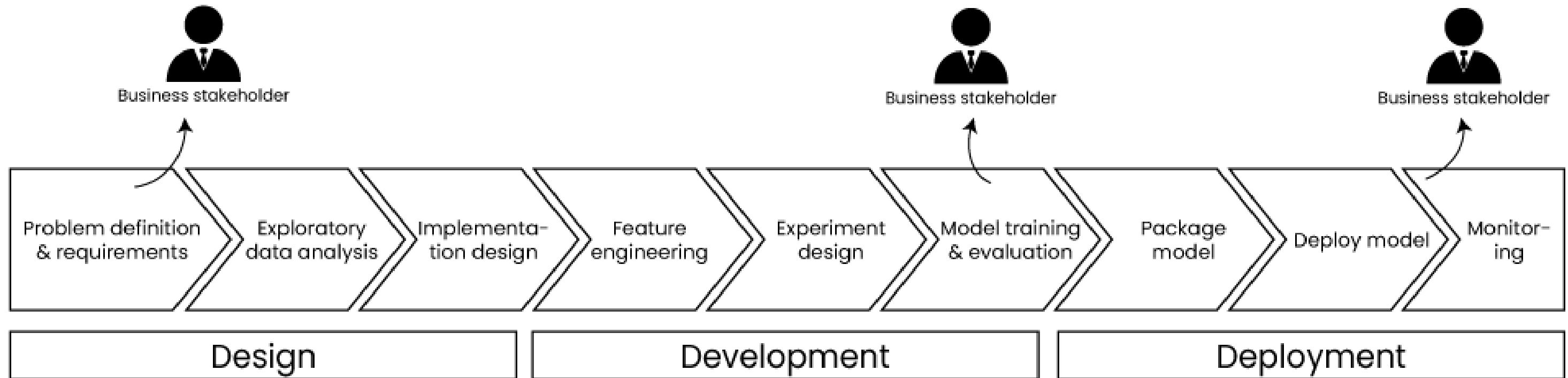ML Engineer

Machine learning lifecycle

- Business roles

- Technical roles
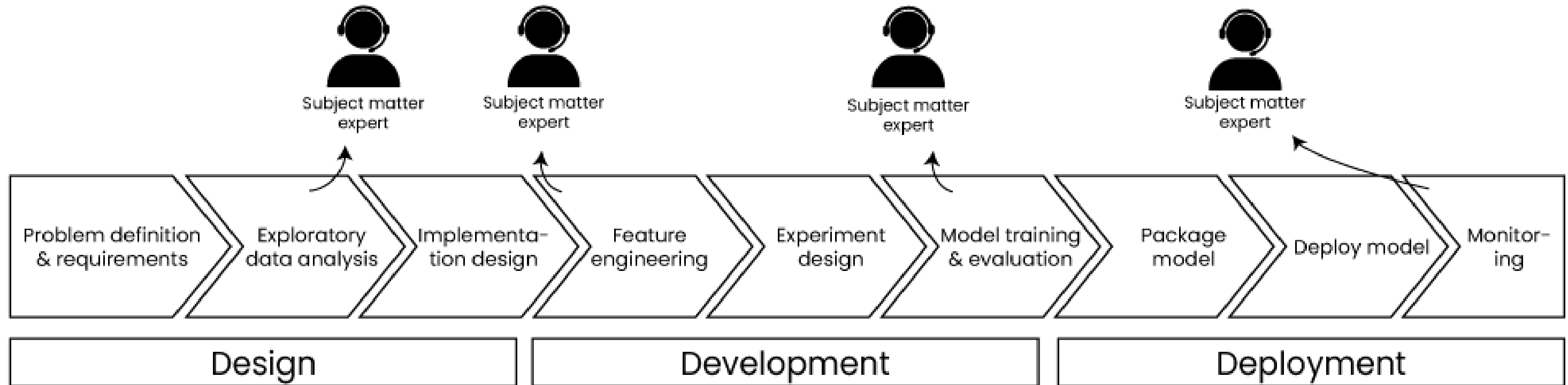
Business roles

- Business stakeholder

- Subject matter expert

Business roles: business stakeholder

- Budget decisions

- Vision of company

- Involved throughout the lifecycle

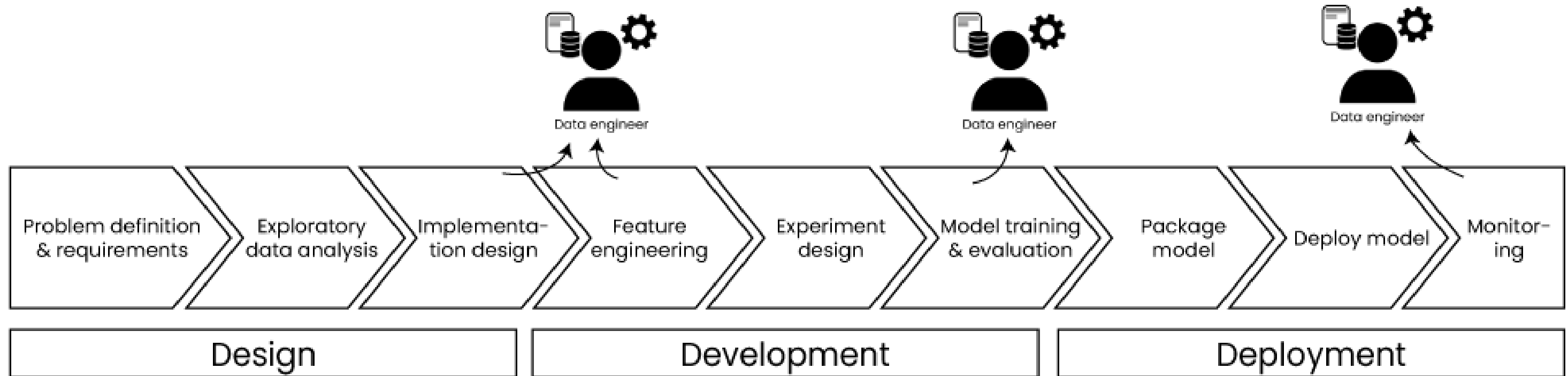# Business roles: subject matter expert

- Domain knowledge

- Involved throughout the lifecycle

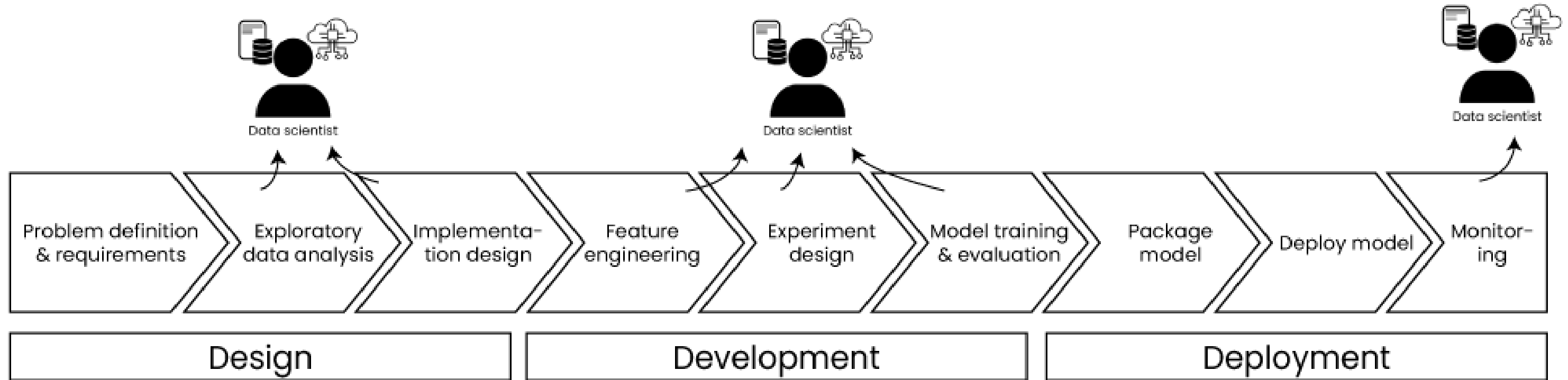- Interpret and validate data

Technical roles

- Data engineer

- Data scientist

- Software engineer

- ML engineer

- Backend engineer

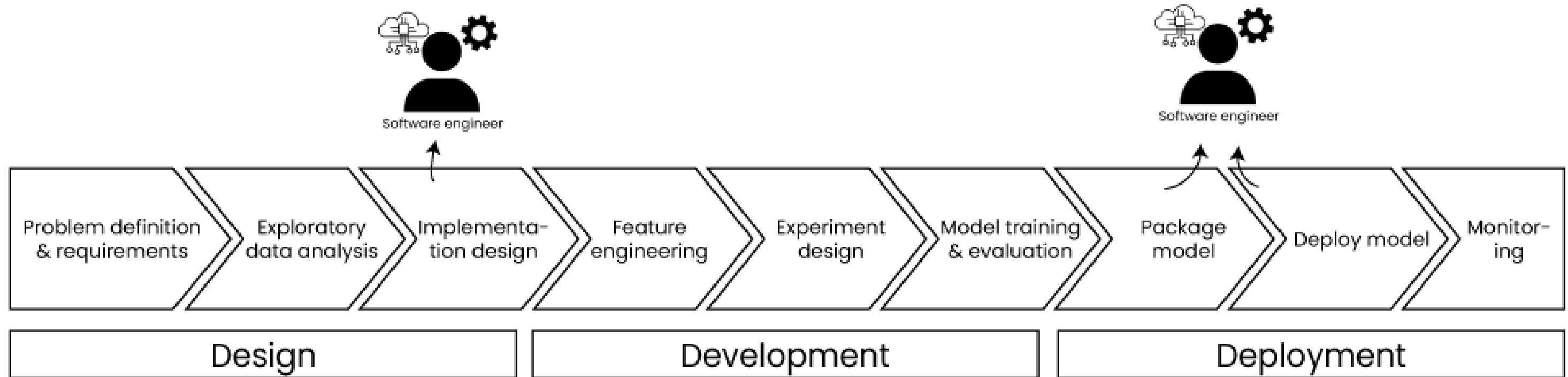# Technical roles: data engineer

- Collecting, storing, and processing data

- Check and maintain data quality
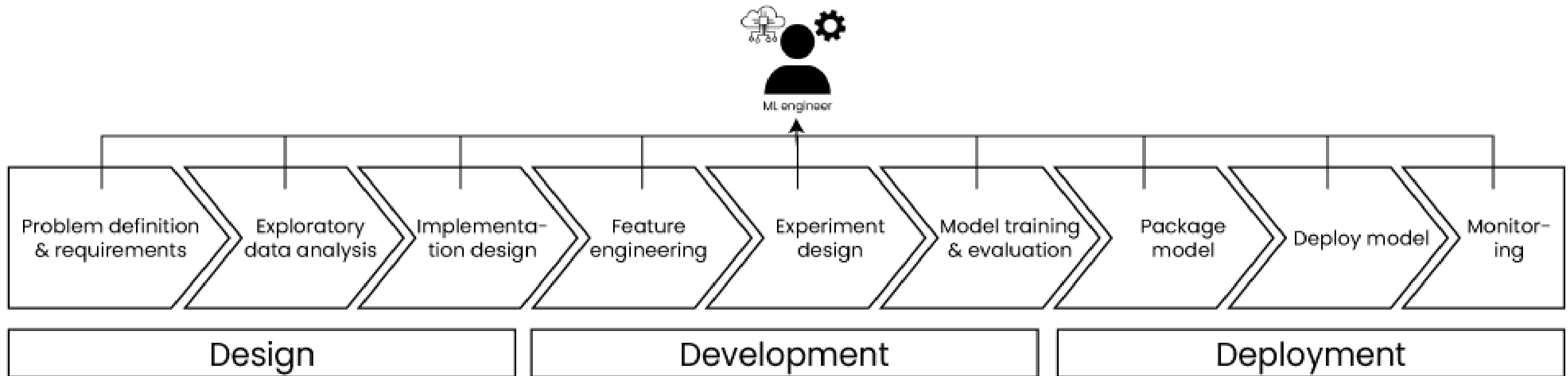
Technical roles: data scientist

- Data analysis

- Model training and evaluation

Technical roles: software engineer

- Write software for model deployment

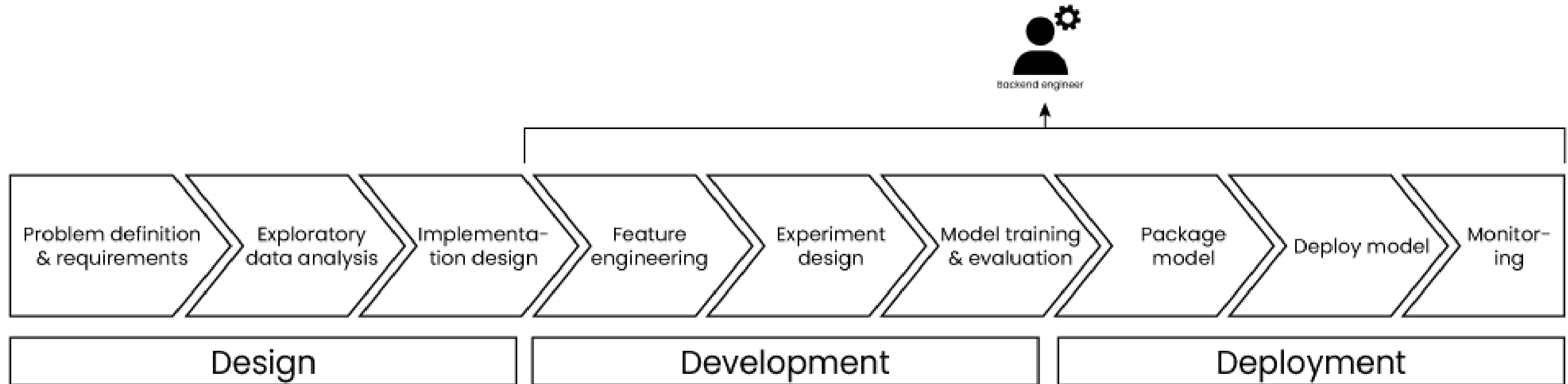- Make sure that code follows guidelines

Technical roles: ML engineer

- Versatile role

- Specifically designed for complete machine learning lifecycle

Technical roles: backend engineer

- Enable development and deployment

- Cloud infrastructure

Let's practice!

MLOPS CONCEPTS