

# What is MLOps?

MLOPS CONCEPTS

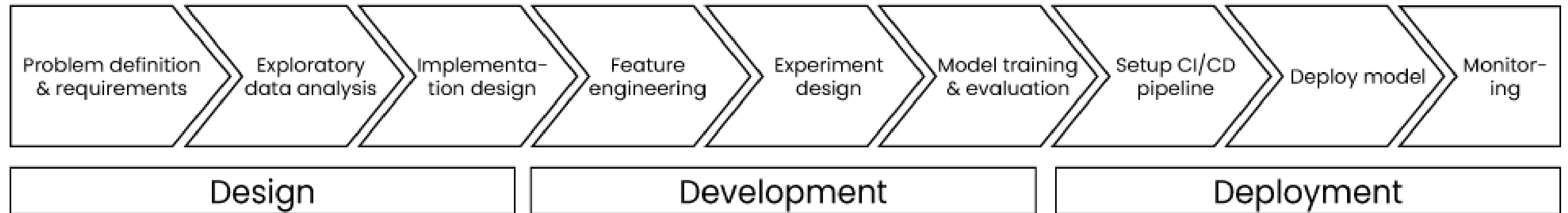


**Folkert Stijnman**  
ML Engineer

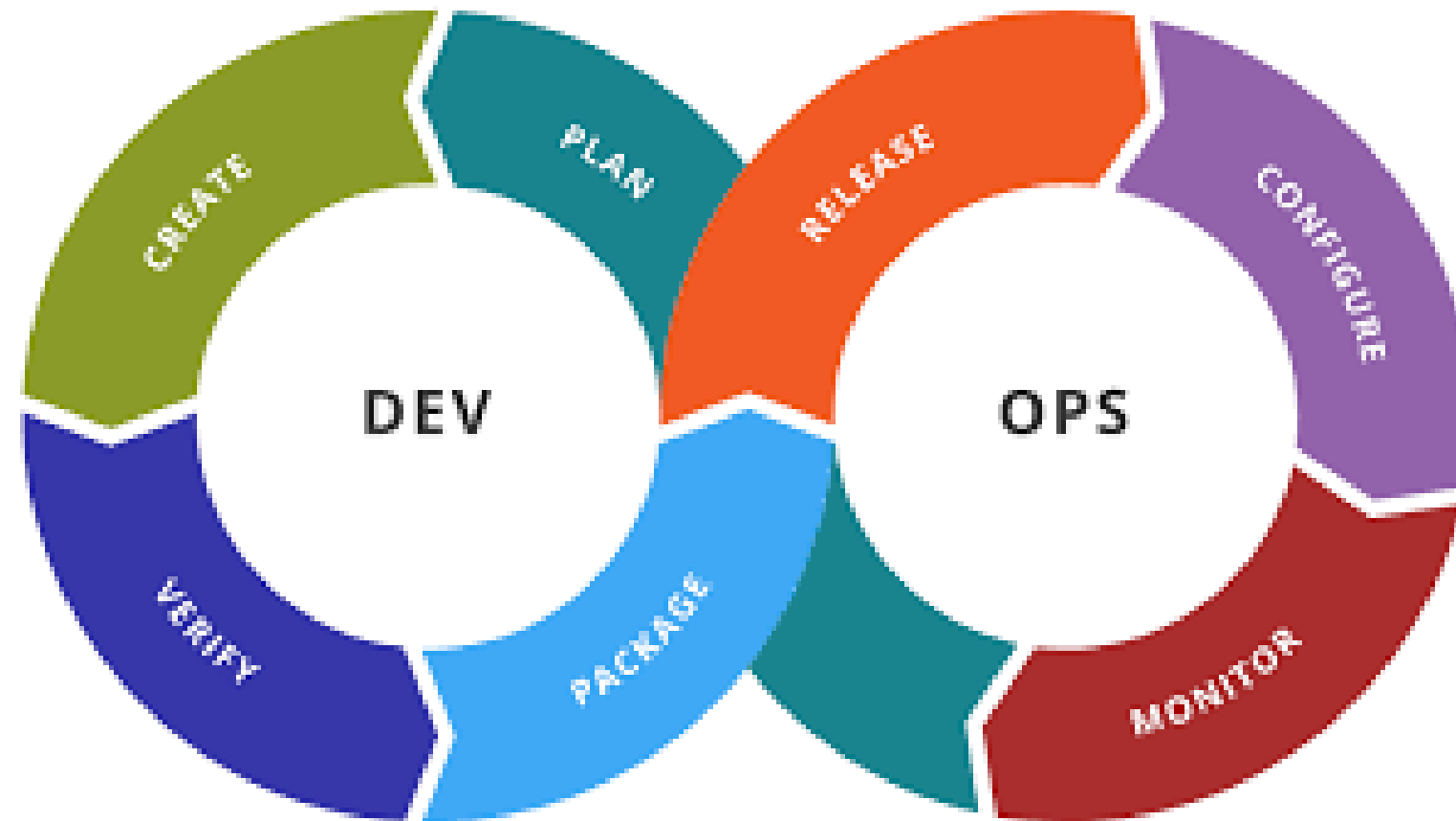
# Machine Learning Operations

*...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

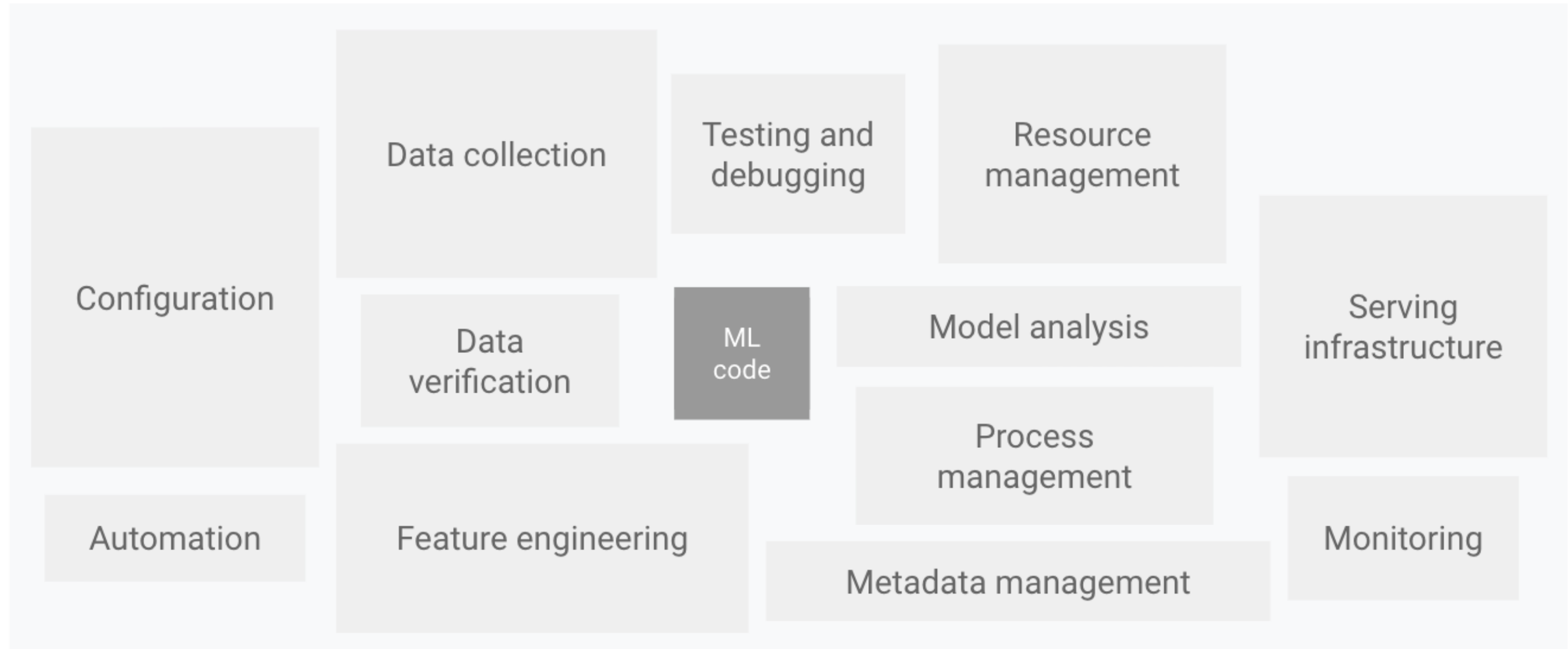


# The origin of MLOps



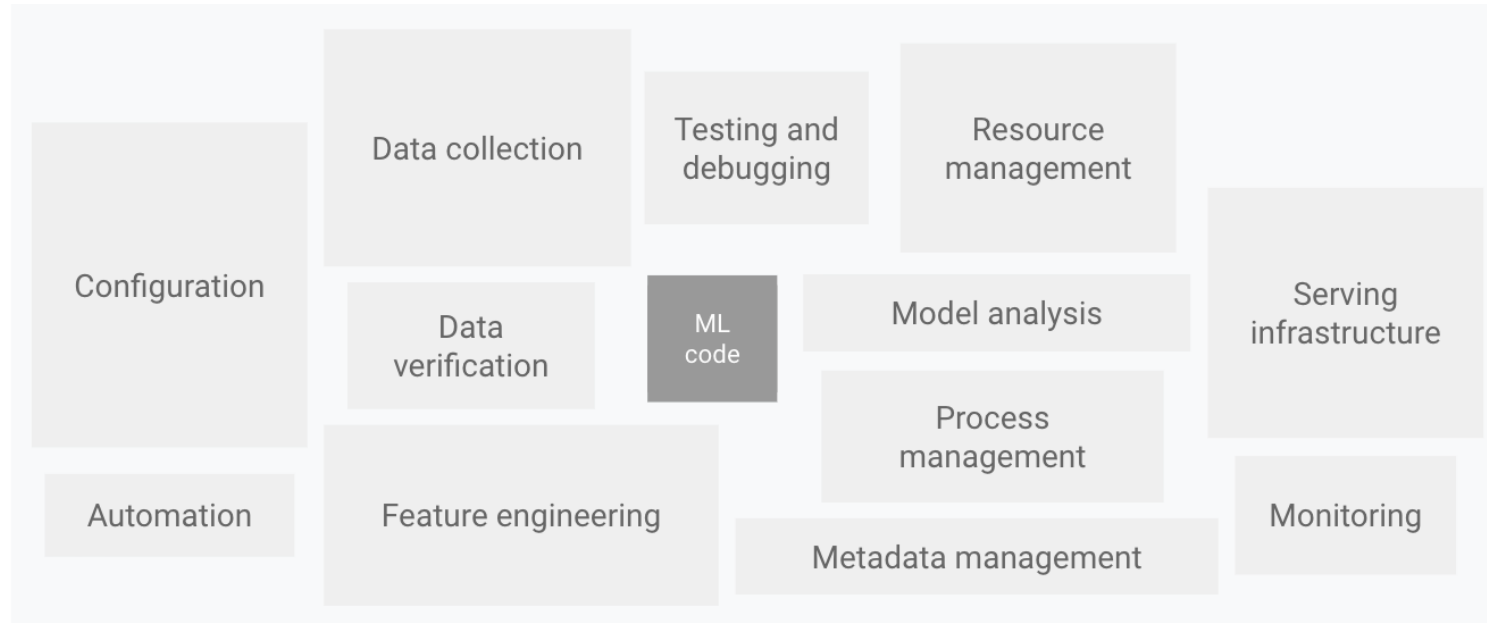
- Practices and tools to deliver software applications
- Development and Operations used to be separate

# Why MLOps



<sup>1</sup> <https://cloud.google.com/architecture/mlops-continuous-delivery-and-automation-pipelines-in-machine-learning>

# Why MLOps



- Improved collaboration
- Automation of deployment
- Monitoring of model performance

**Let's practice!**  
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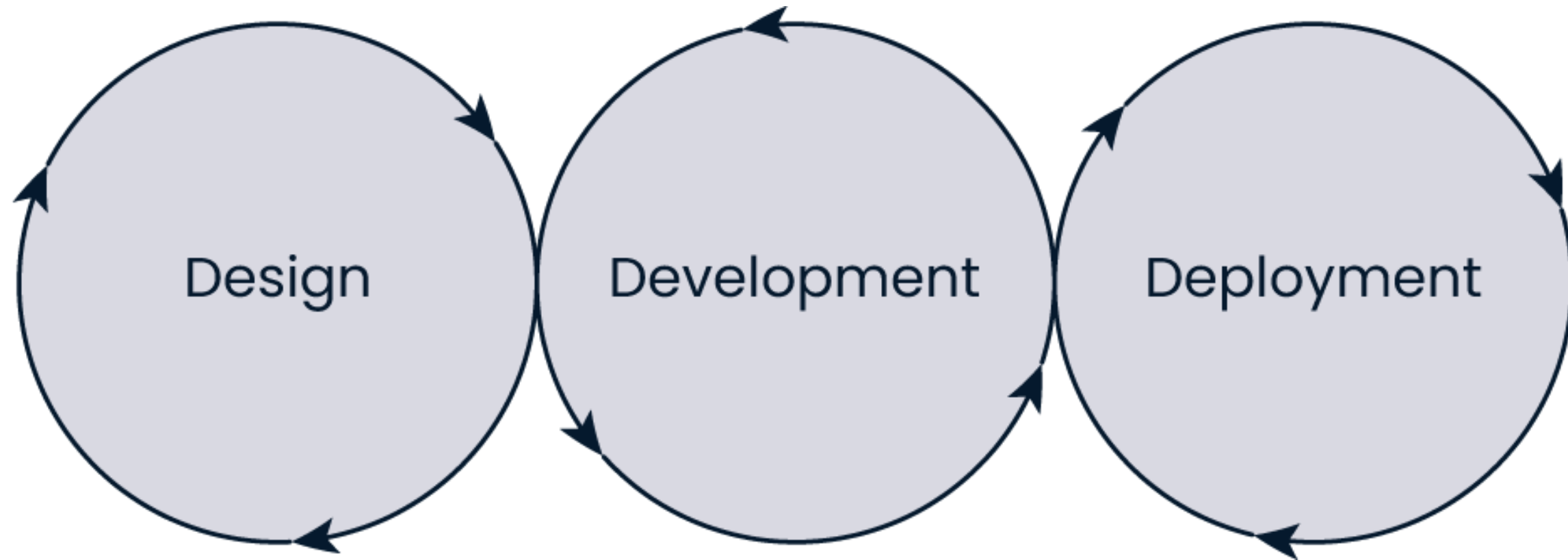
# Different phases in MLOps

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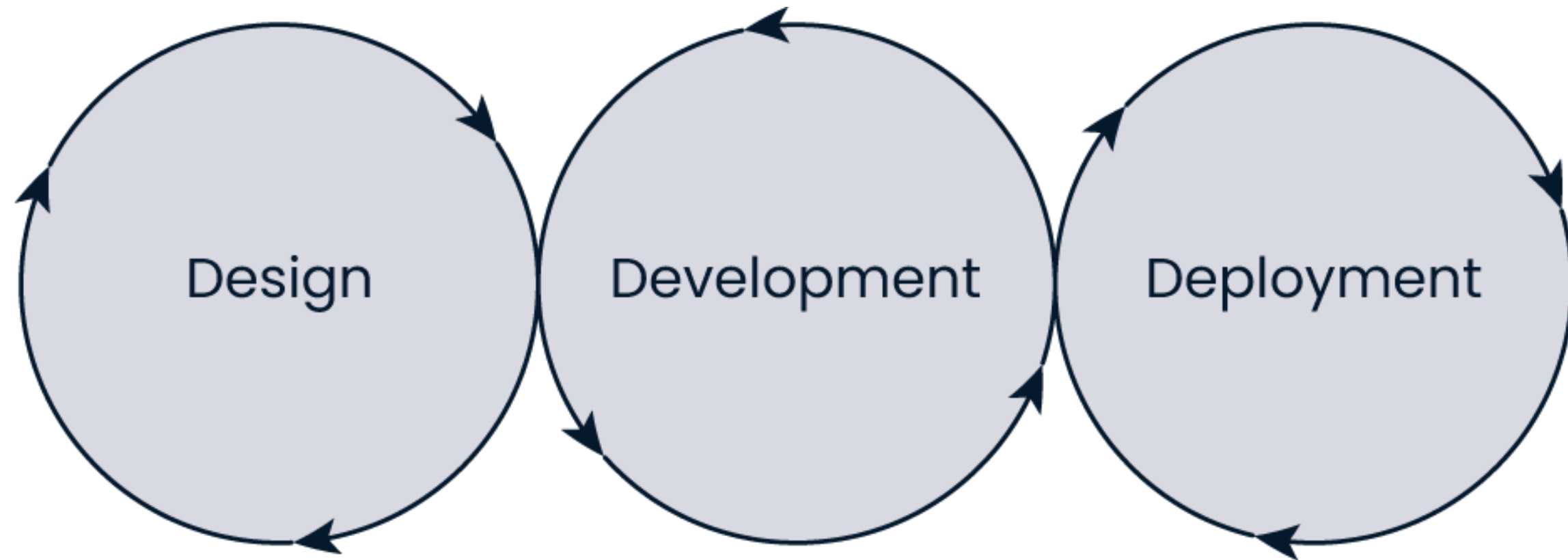
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# MLOps lifecycle



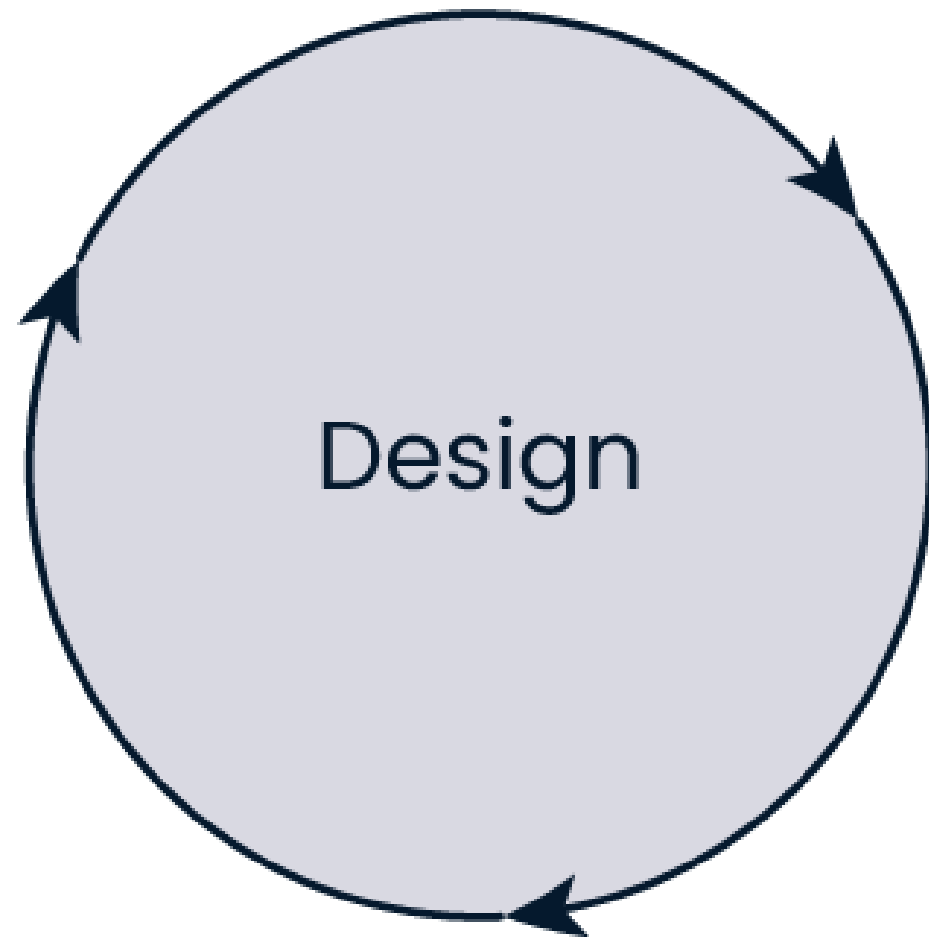


# Why the machine learning lifecycle?



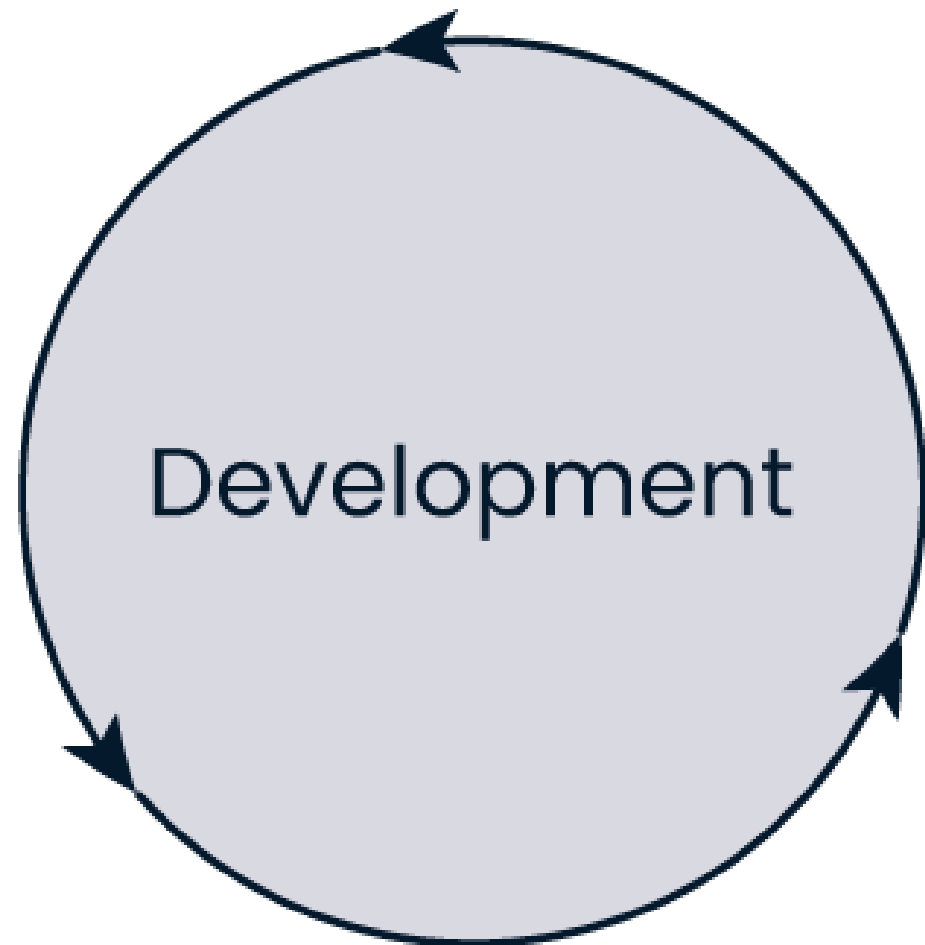
- Structures the ML process
- Defines key players at each stage
- Toolkit for optimization

# Design phase



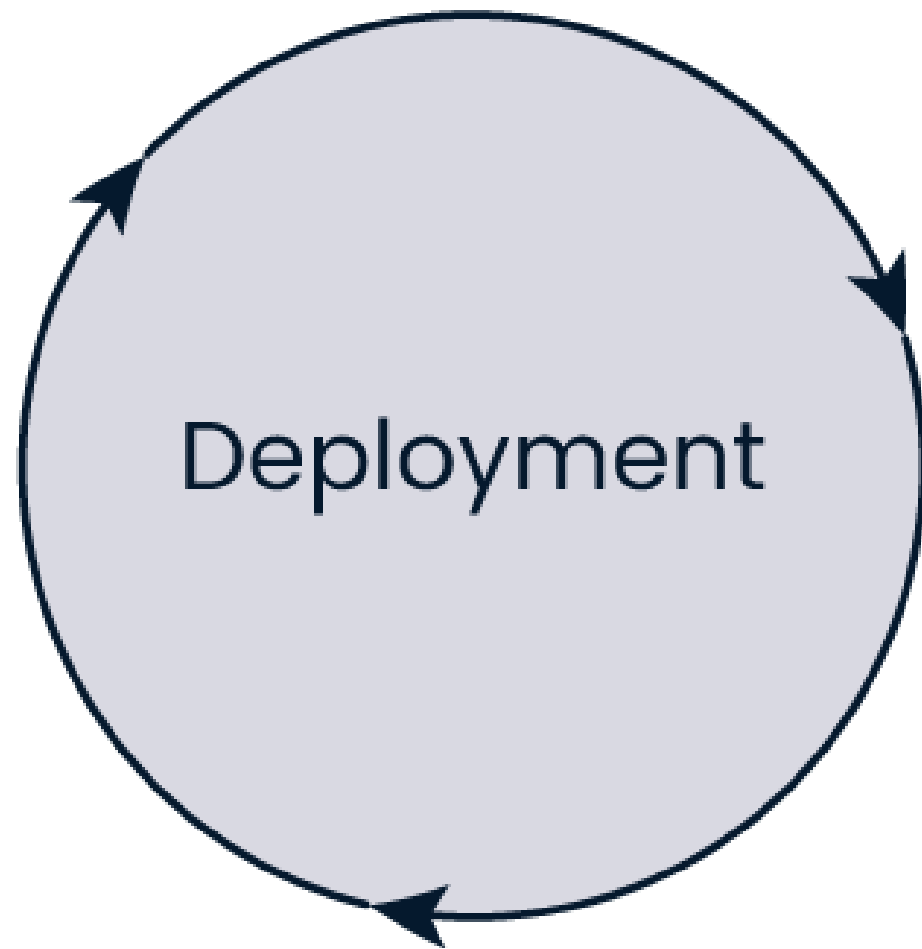
- Context of the problem
- Added value
- Business requirements
- Key metrics
- Data processing

# Development phase



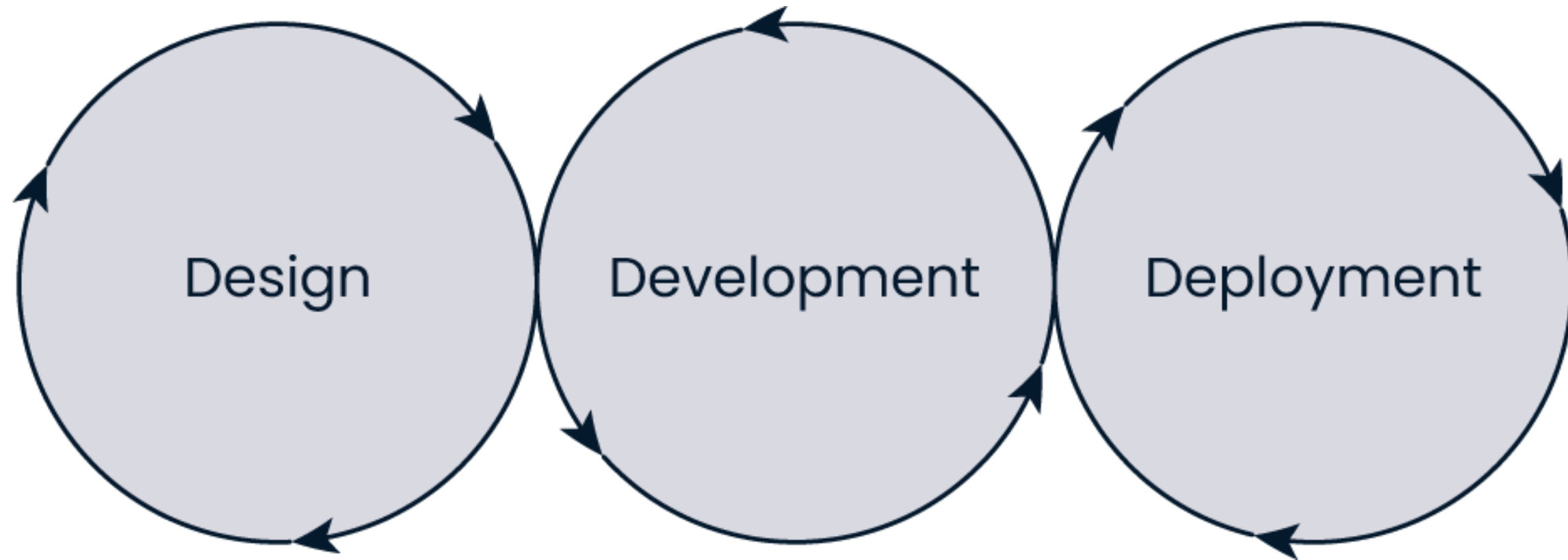
- Develop machine learning model
- Experiment with data, algorithms, and hyperparameters
- Model ready for deployment

# Deployment phase



- Integrate the machine learning model in business
- Deploying the model in production
- Monitoring the performance

# MLOps lifecycle



# Let's practice!

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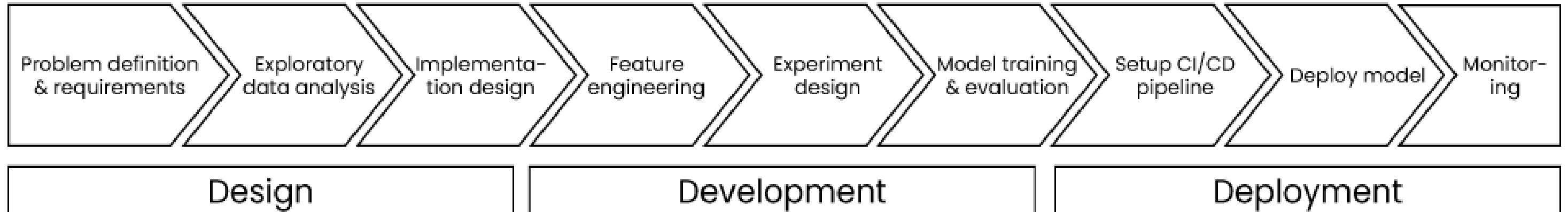
# Roles in MLOps

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ML Engineer

# Machine learning lifecycle



- Business roles
- Technical roles

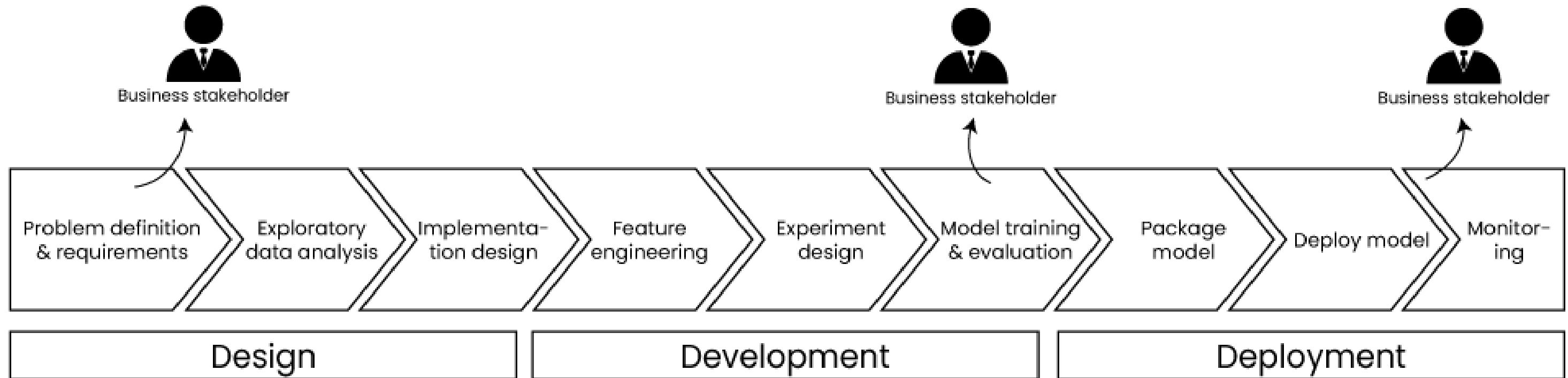


# Business roles

- Business stakeholder
- Subject matter expert

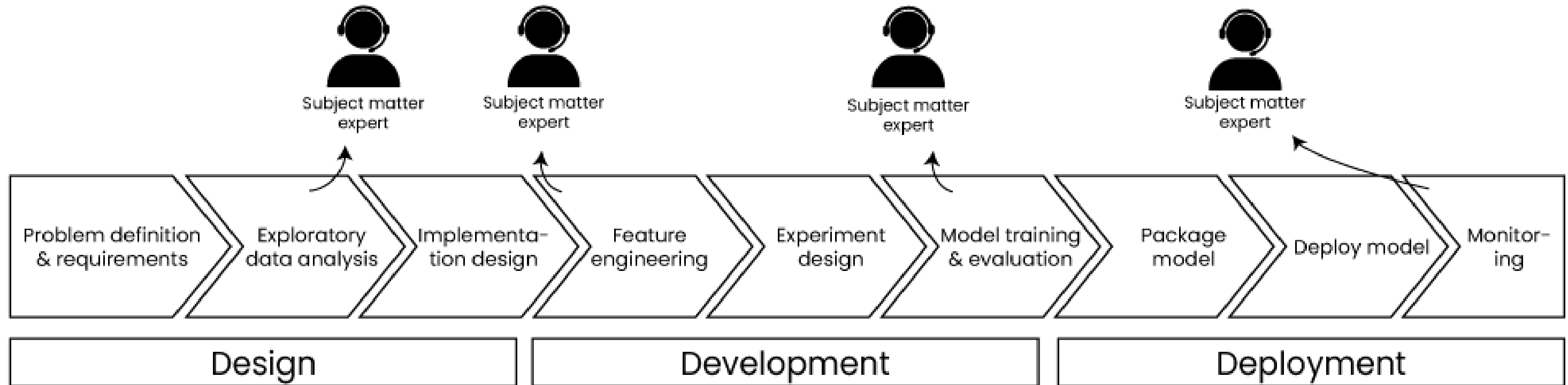


# Business roles: business stakeholder



- Budget decisions
- Vision of company
- Involved throughout the lifecycle

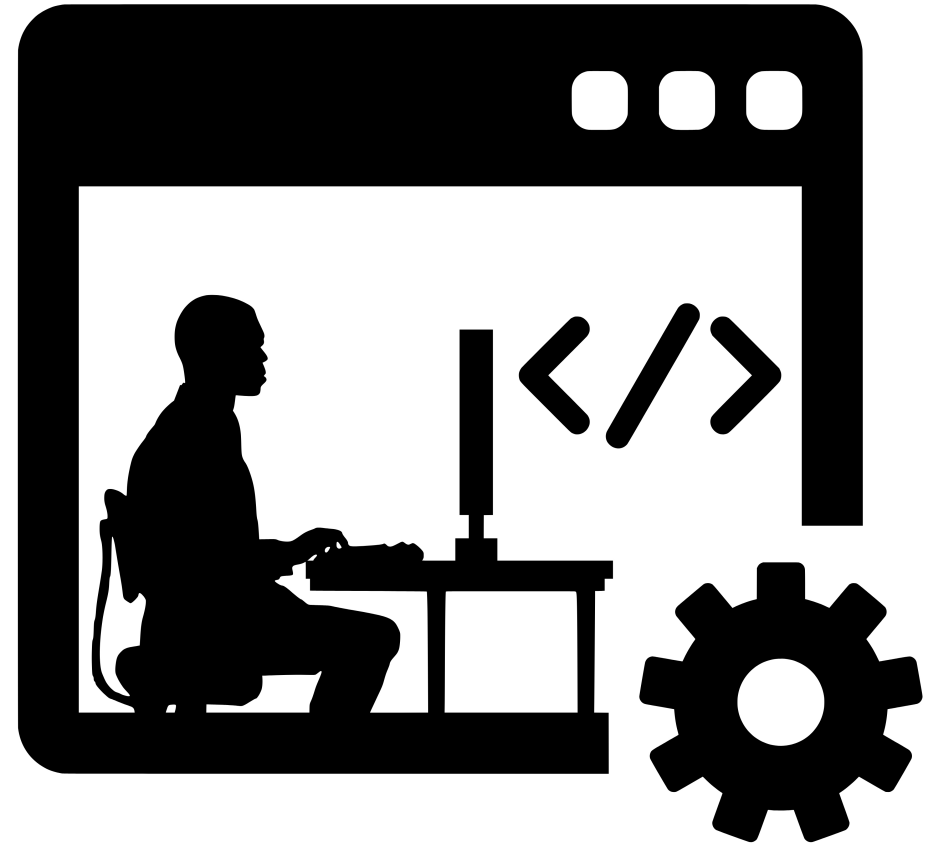
# Business roles: subject matter expert



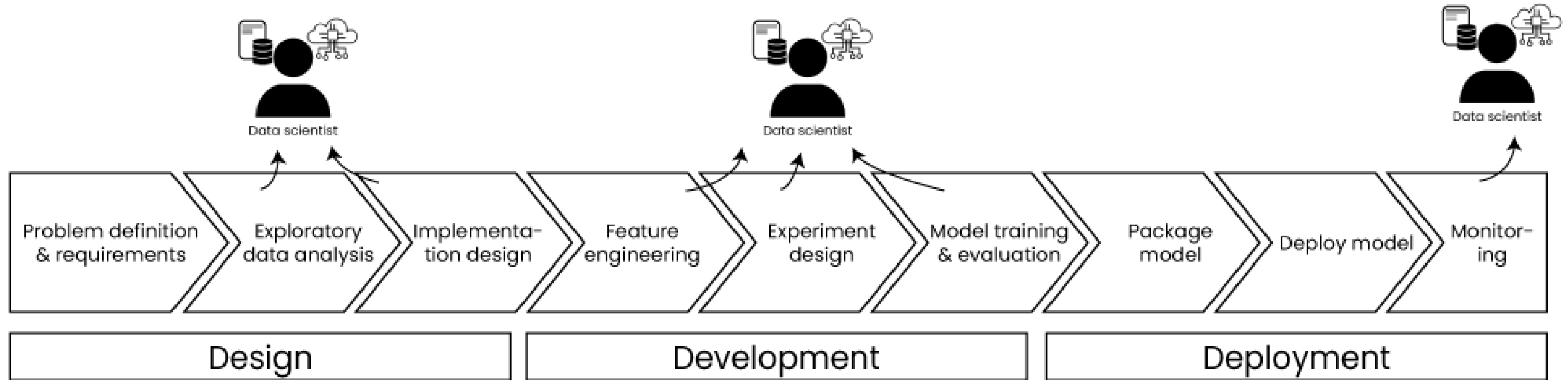
- Domain knowledge
- Involved throughout the lifecycle
- Interpret and validate data

# Technical roles

- Data scientist
- Data engineer
- ML engineer

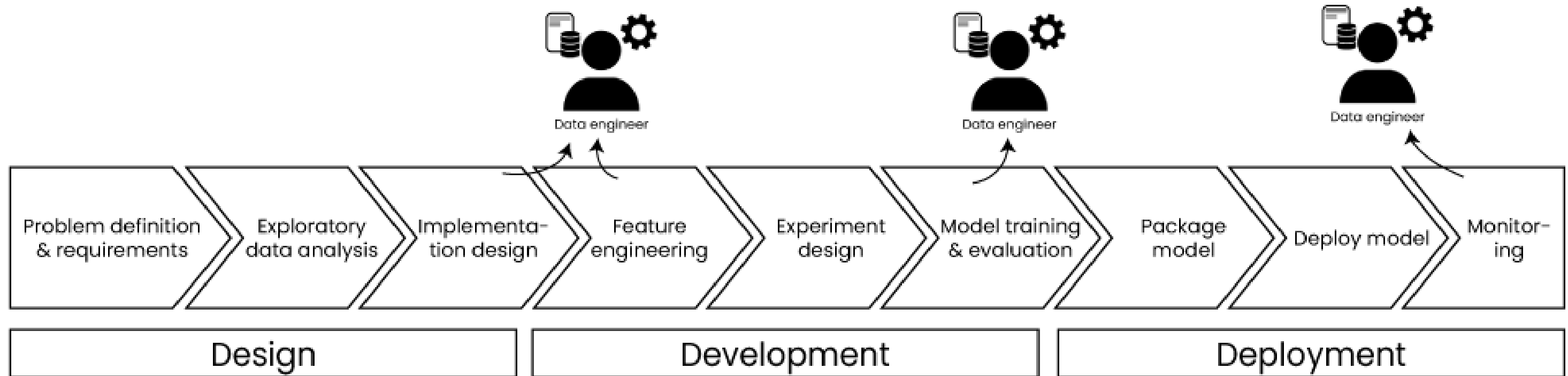


# Technical roles: data scientist



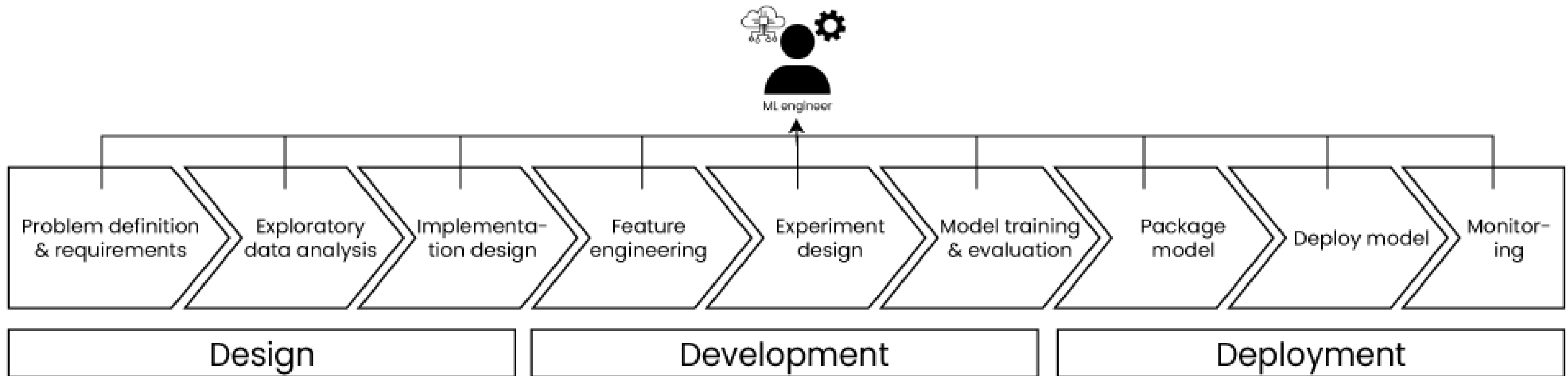
- Data analysis
- Model training and evaluation

# 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
- Responsibility of roles can vary depending on application of machine learning
- Startup is different from a large enterprise





**Let's practice!**  
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