What is MLOps?

MLOPS CONCEPTS

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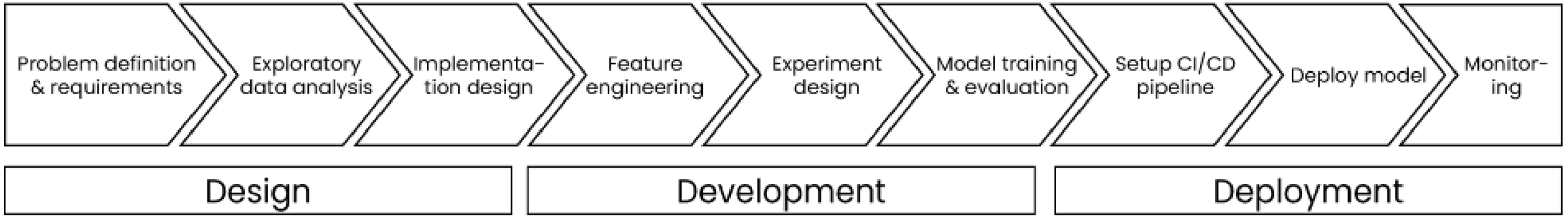
ML Engineer

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

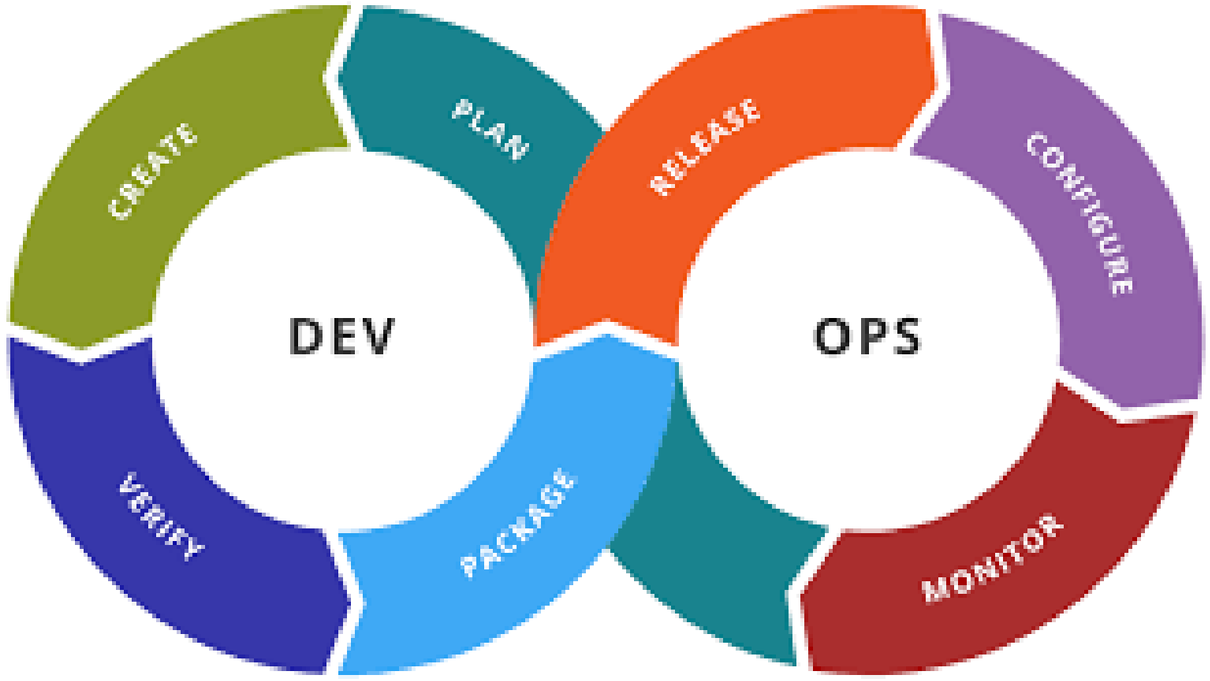


Why MLOps

- Ingredients
- Guest taste
- People in service
- Kitchen equipment

- Business requirements and value
- Data
- Algorithm
- Computer

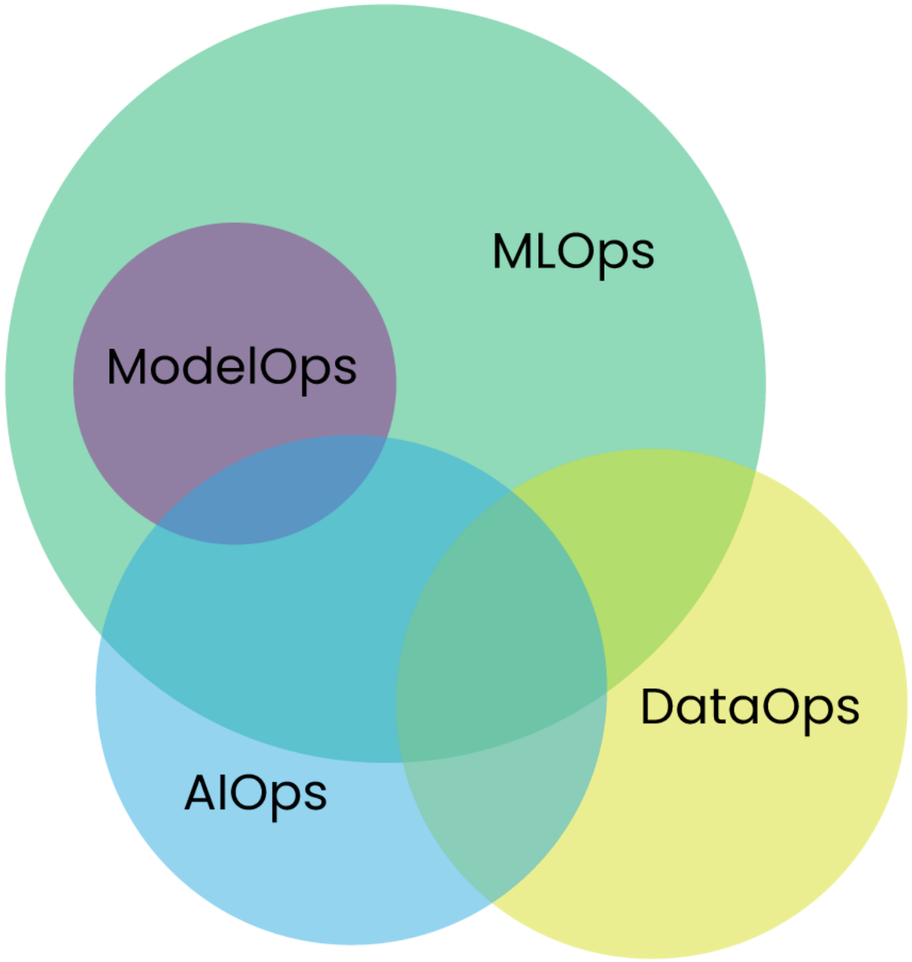
The origin of MLOps



- 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!

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Different phases in MLOps

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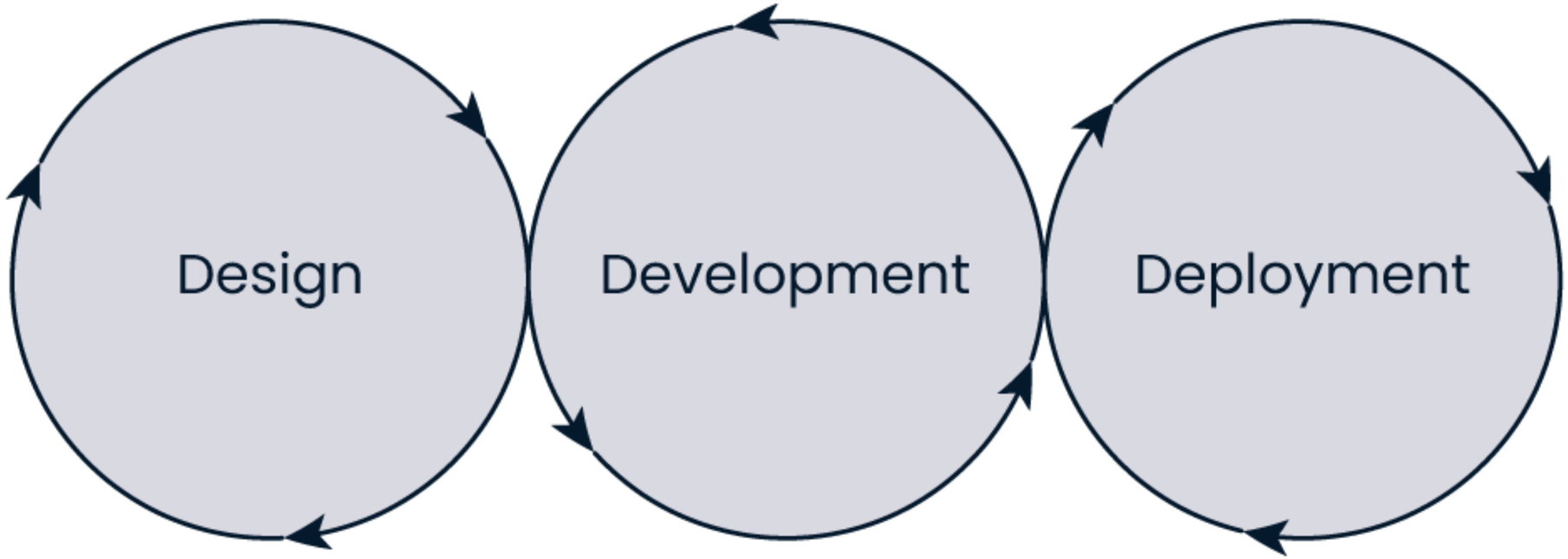
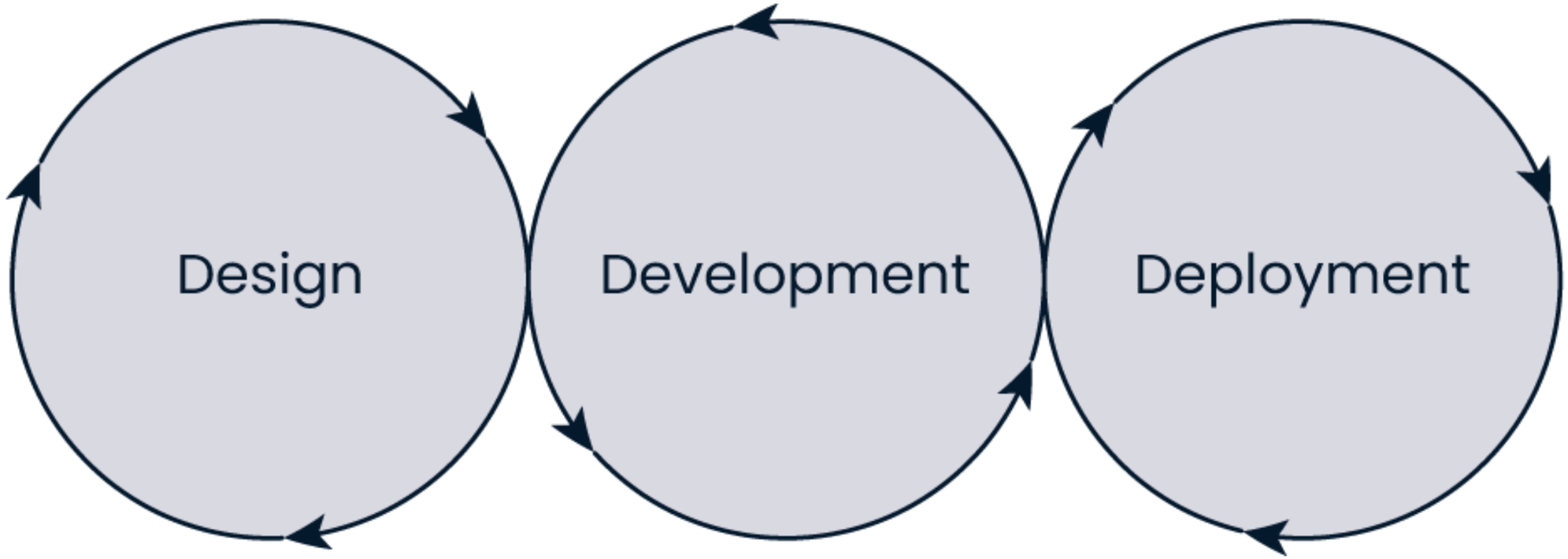
MLOps lifecycle



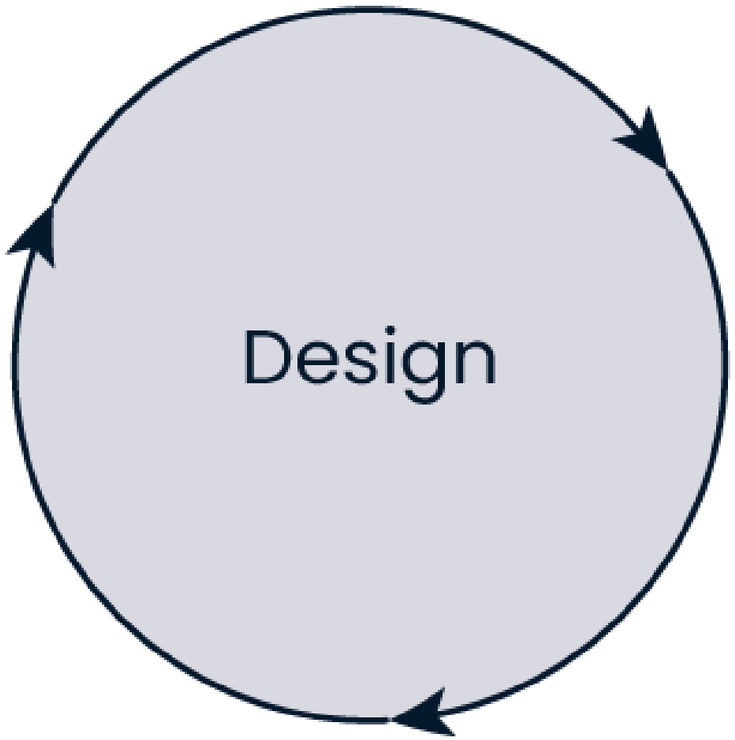
- It is not uncommon to go back and forth between phases
- It is important to constantly evaluate with stakeholders whether the machine learning project should be continued

Why the machine learning lifecycle?



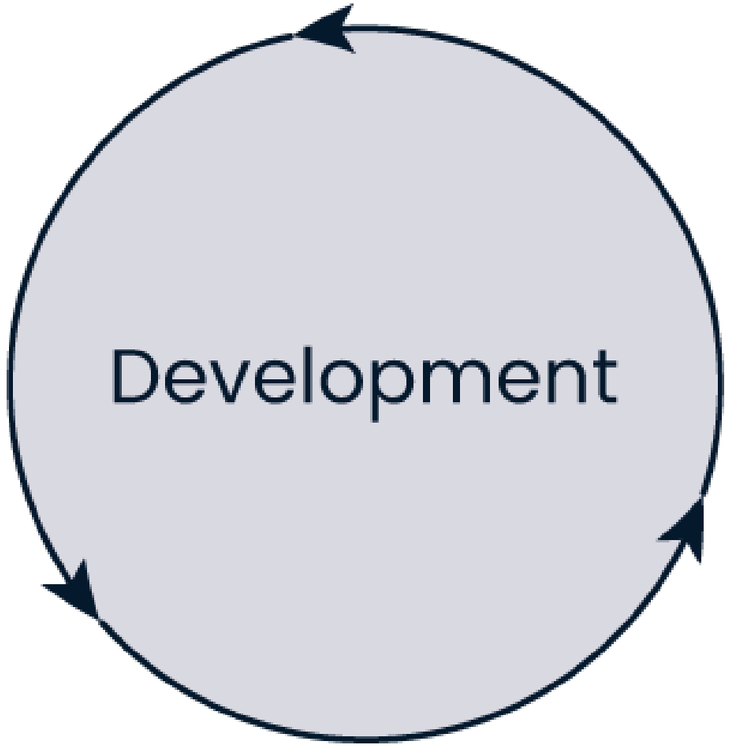
- Structure the process, don't 'just start'
- Defines who is required and when
- Applying practices and tools to specific phases

Design phase



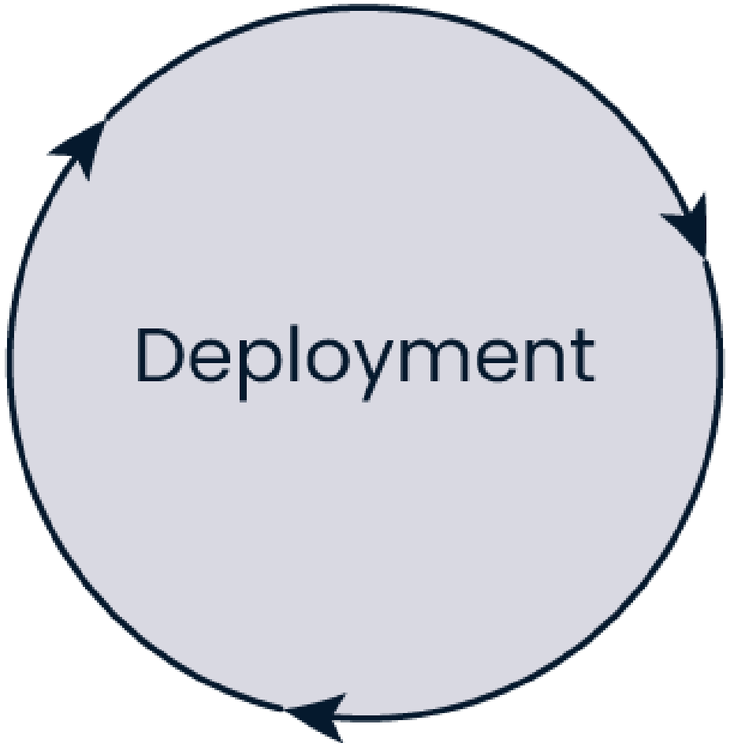
- Context of the problem
- Added value
- Business requirements
- Key metrics
- Data processing

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!

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Roles in MLOps

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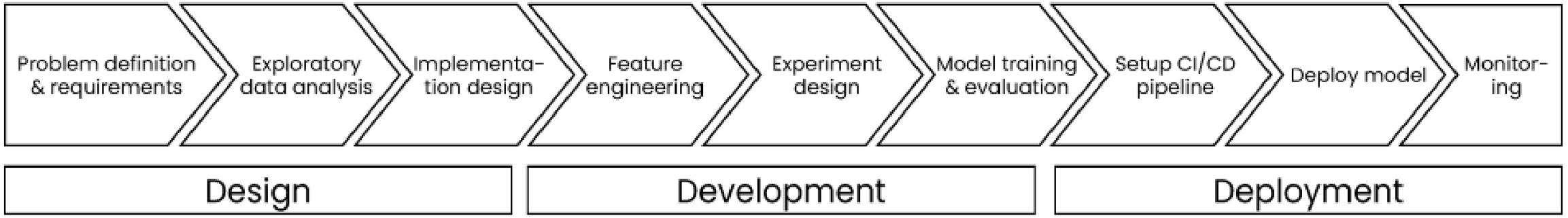
Machine learning lifecycle

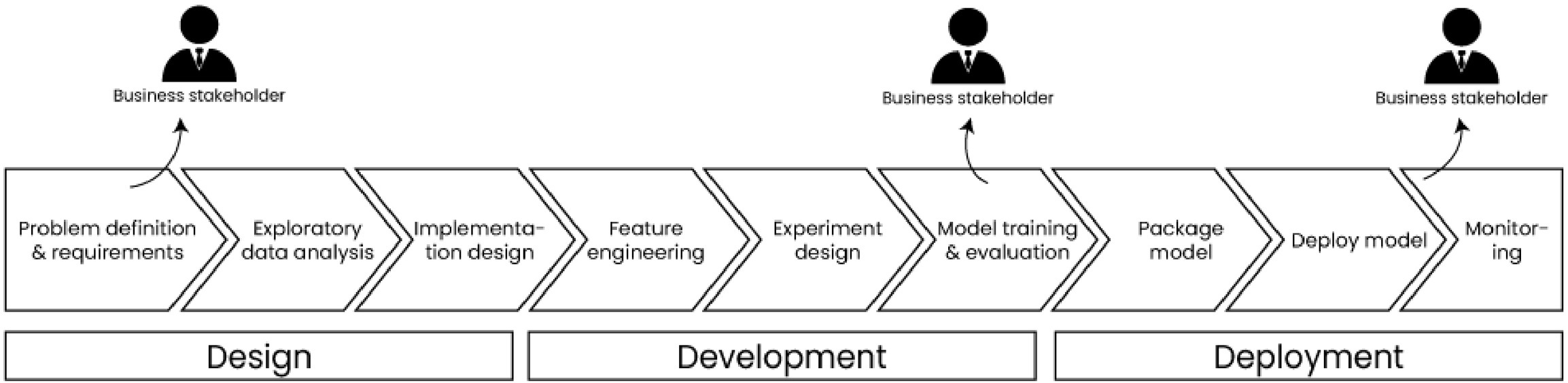


- Business roles
- Technical roles

Business roles

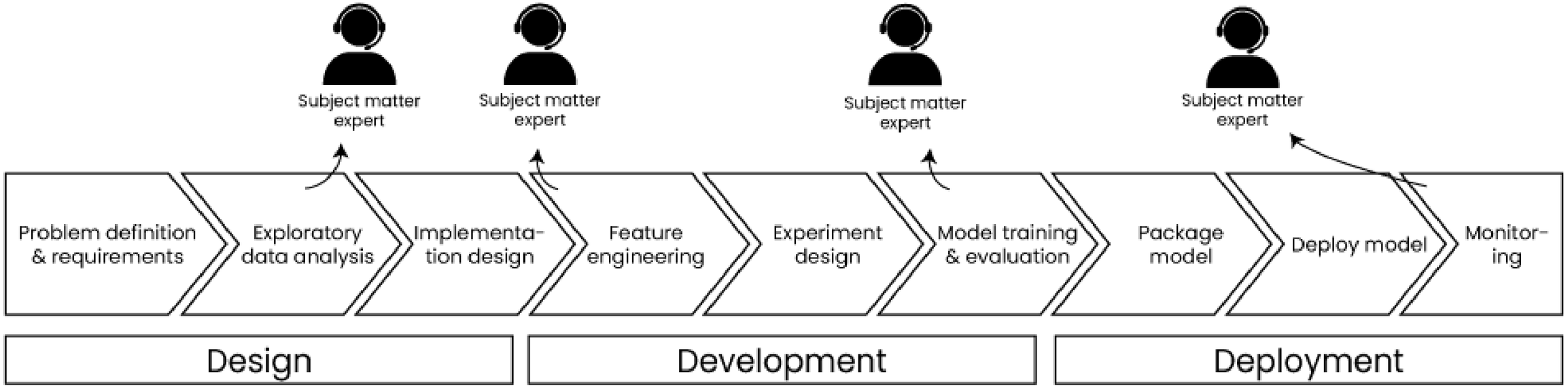
- Business stakeholder
- Subject matter expert

Business roles: business stakeholder



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

Business roles: subject matter expert

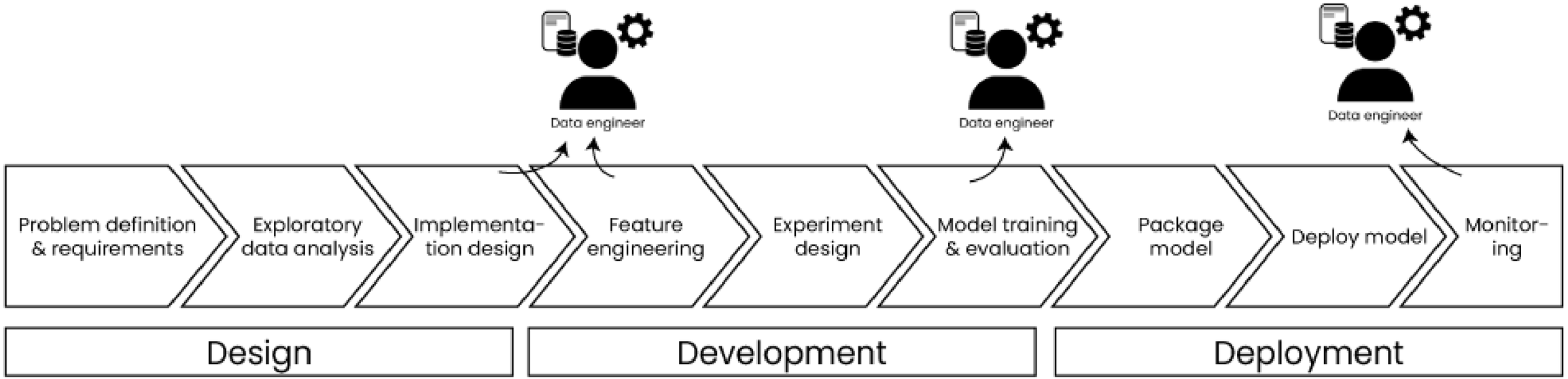


- Domain knowledge
- Involved throughout the lifecycle
- Interpret and validate data

Technical roles

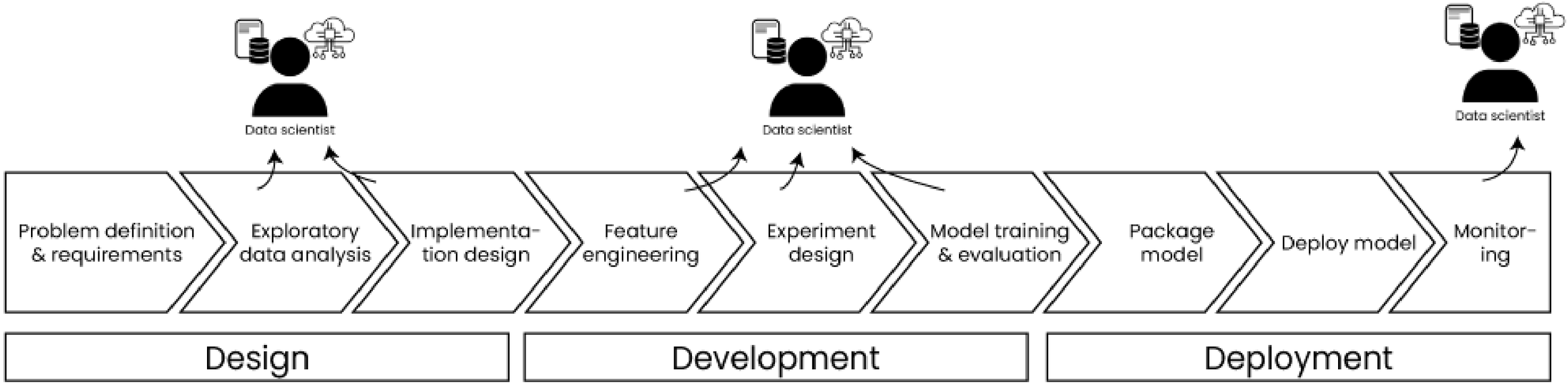
- Data engineer
- Data scientist
- Software engineer
- ML engineer
- Backend engineer

Technical roles: data engineer



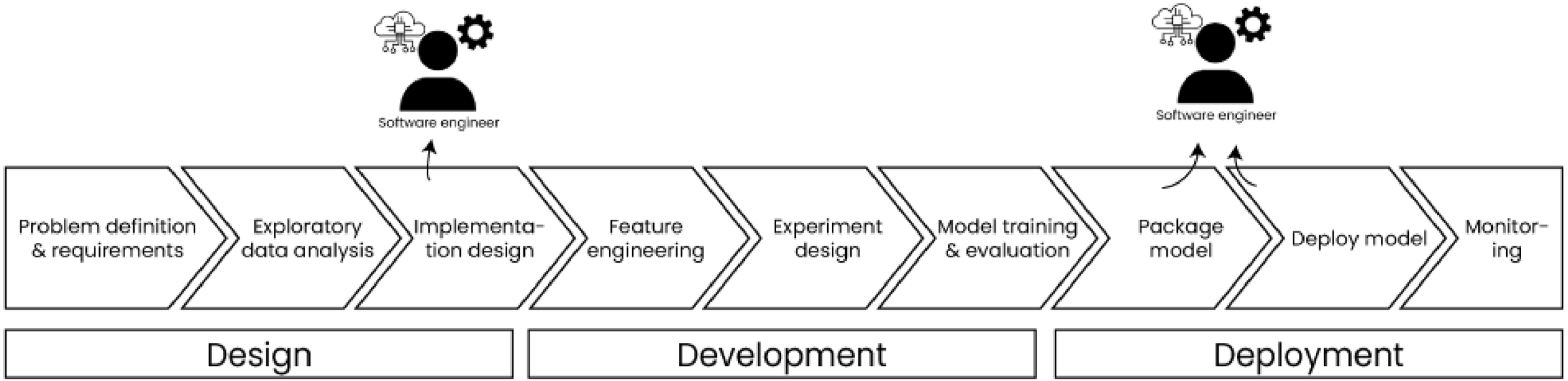
- Collecting, storing, and processing data
- Check and maintain data quality

Technical roles: data scientist



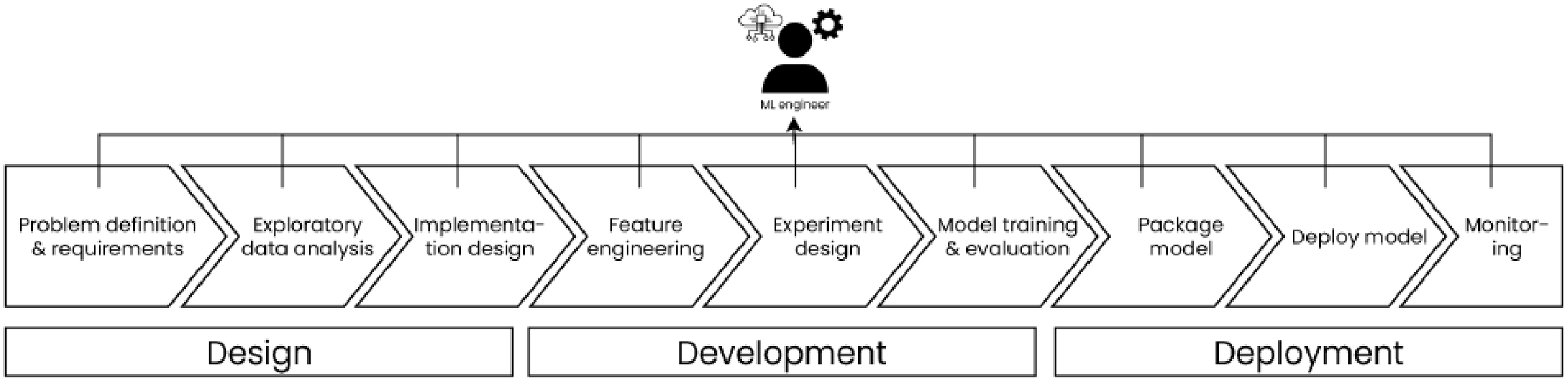
- Data analysis
- Model training and evaluation

Technical roles: software engineer



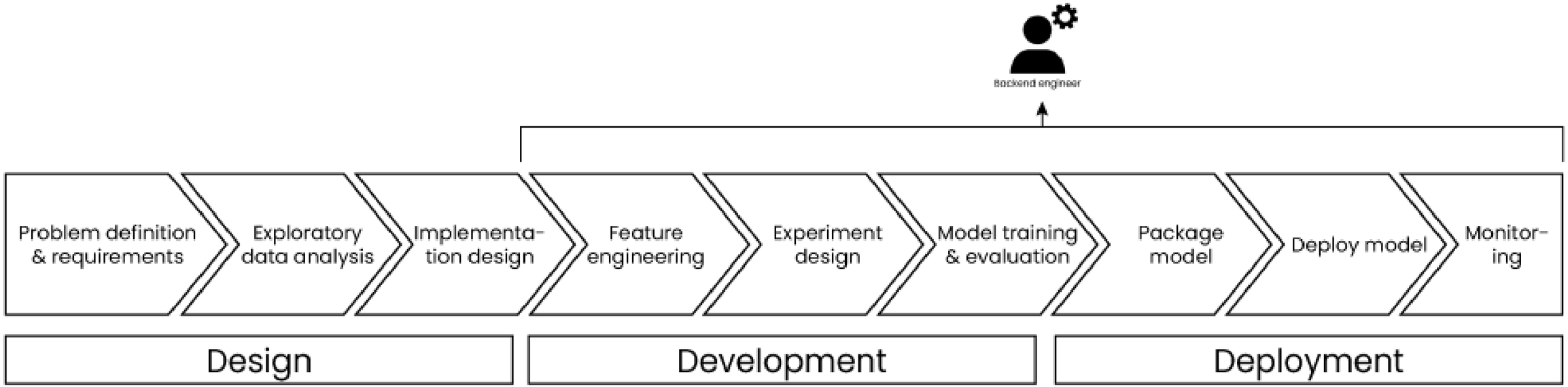
- Write software for model deployment
- Make sure that code follows guidelines

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!

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