Full-stack data scientist

Alexey Grigorev
02.07.2020

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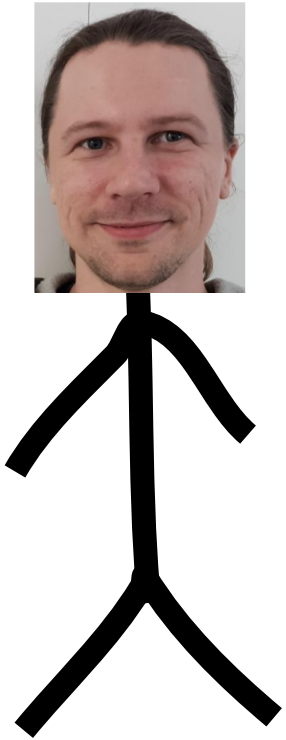


- I’m Alexey
- Data Scientist

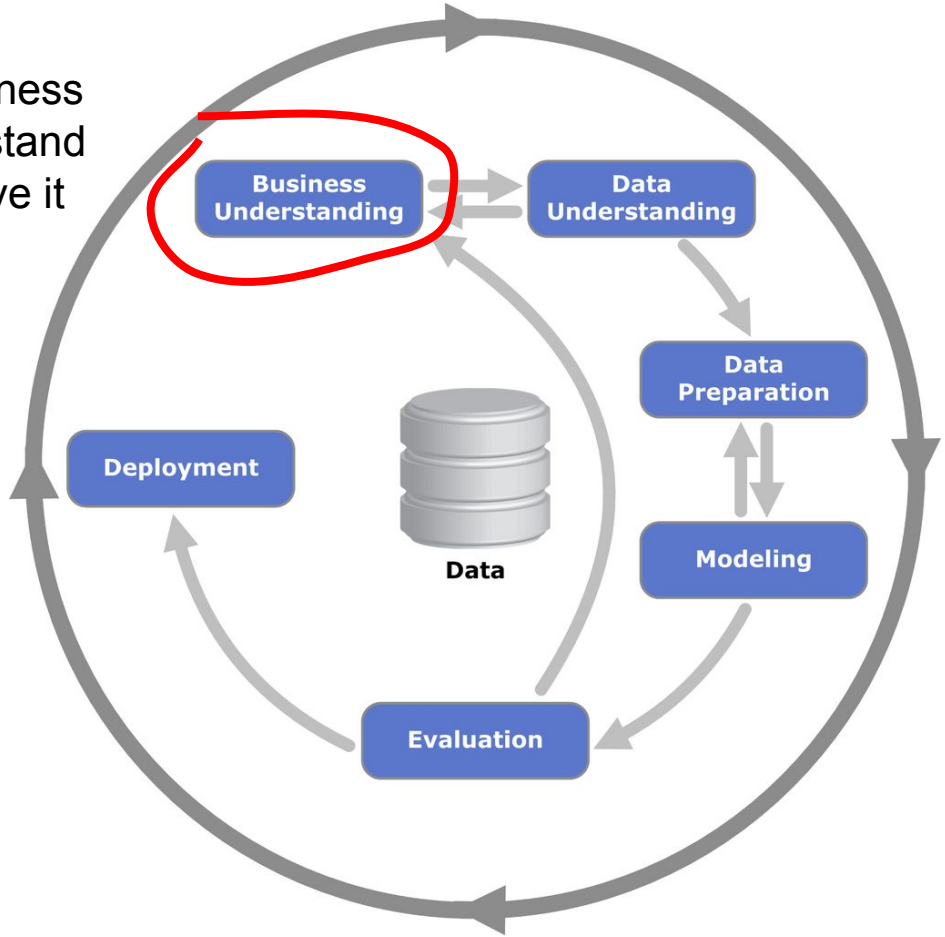
Plan

- Data science process
- Roles in the team
- Full-stack data scientist: Jack of all trades
- Becoming full-stack

Data science

Picture: CRISP-DM

Identify the business problem, understand how we can solve it



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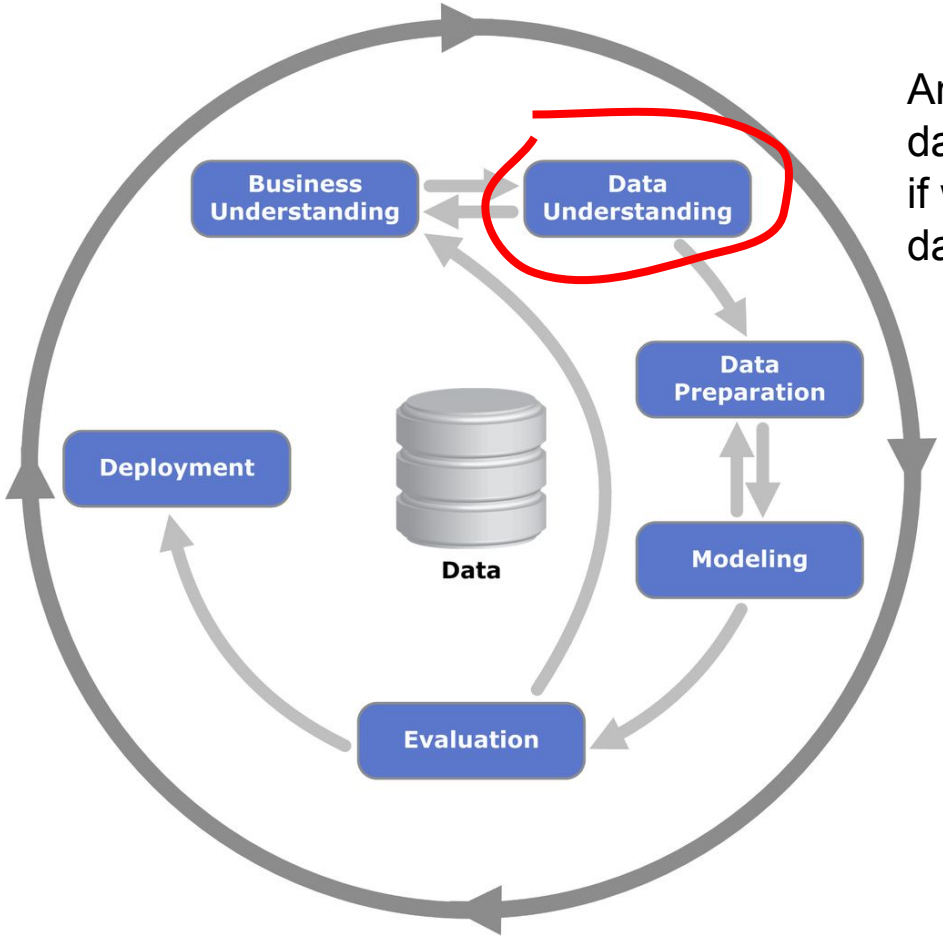
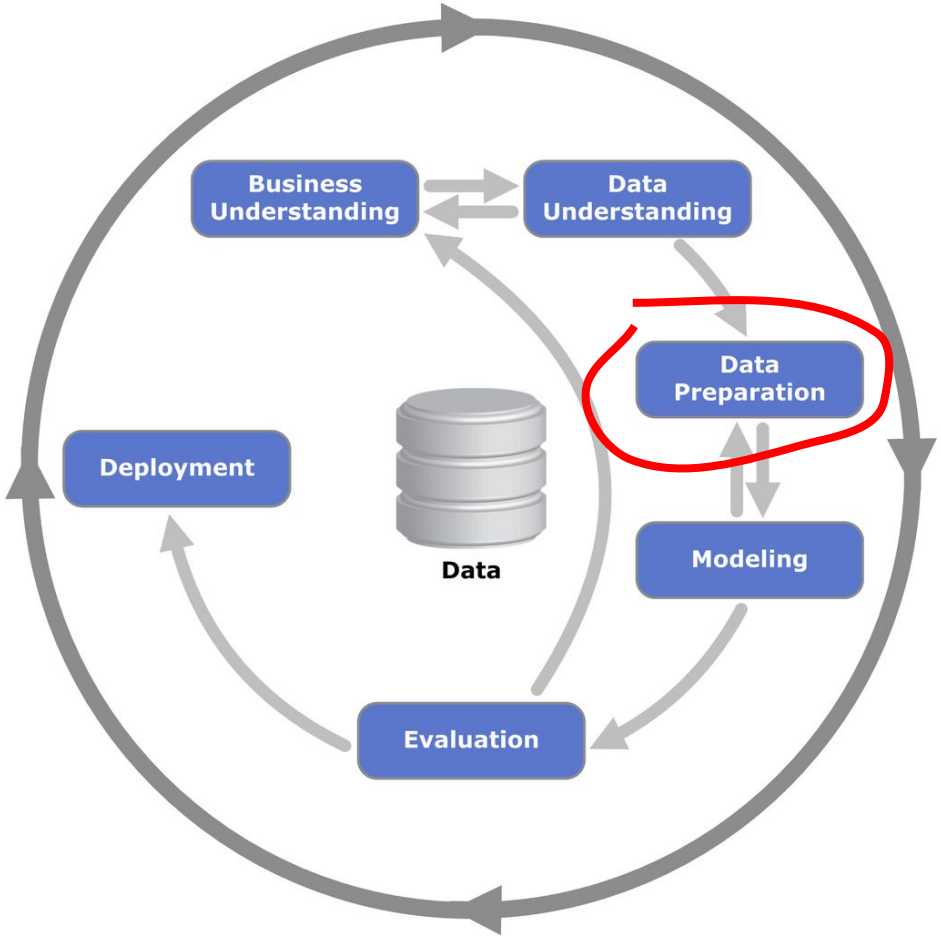


Analyze available data sources, decide if we need to get more data

Picture: CRISP-DM

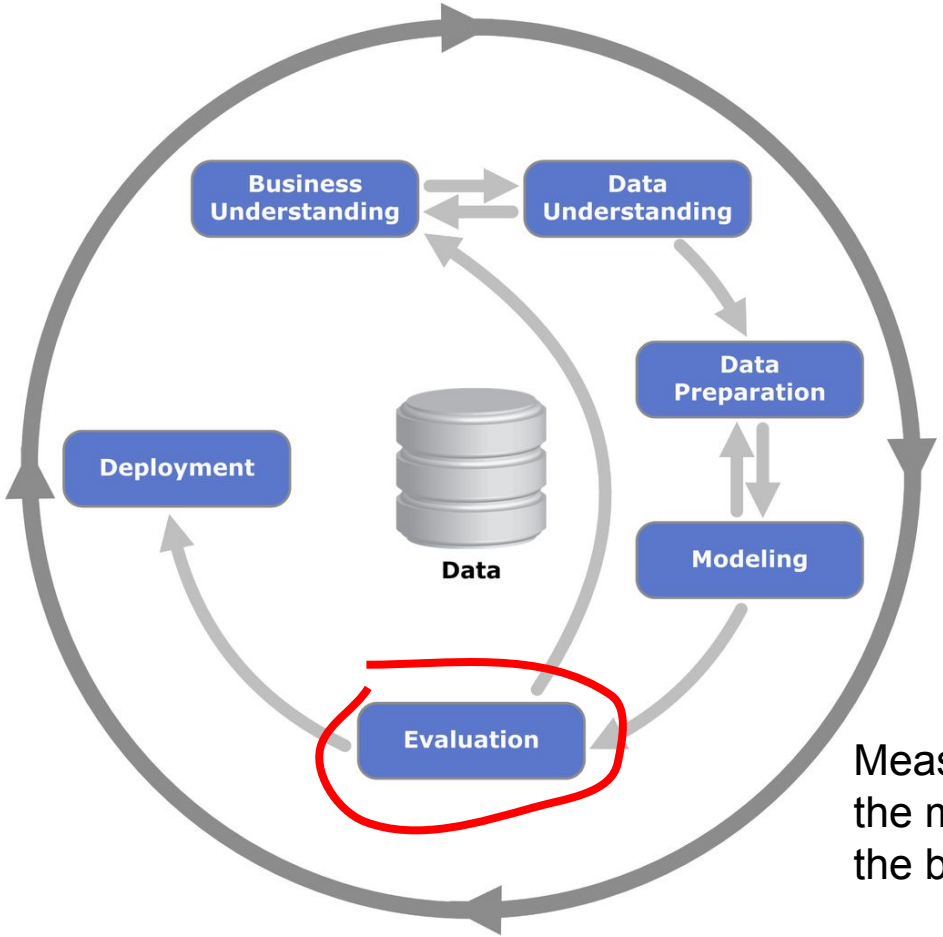


Transform the data so it can be put into a ML algorithm

Picture: CRISP-DM

Training the models: the actual machine learning happens here

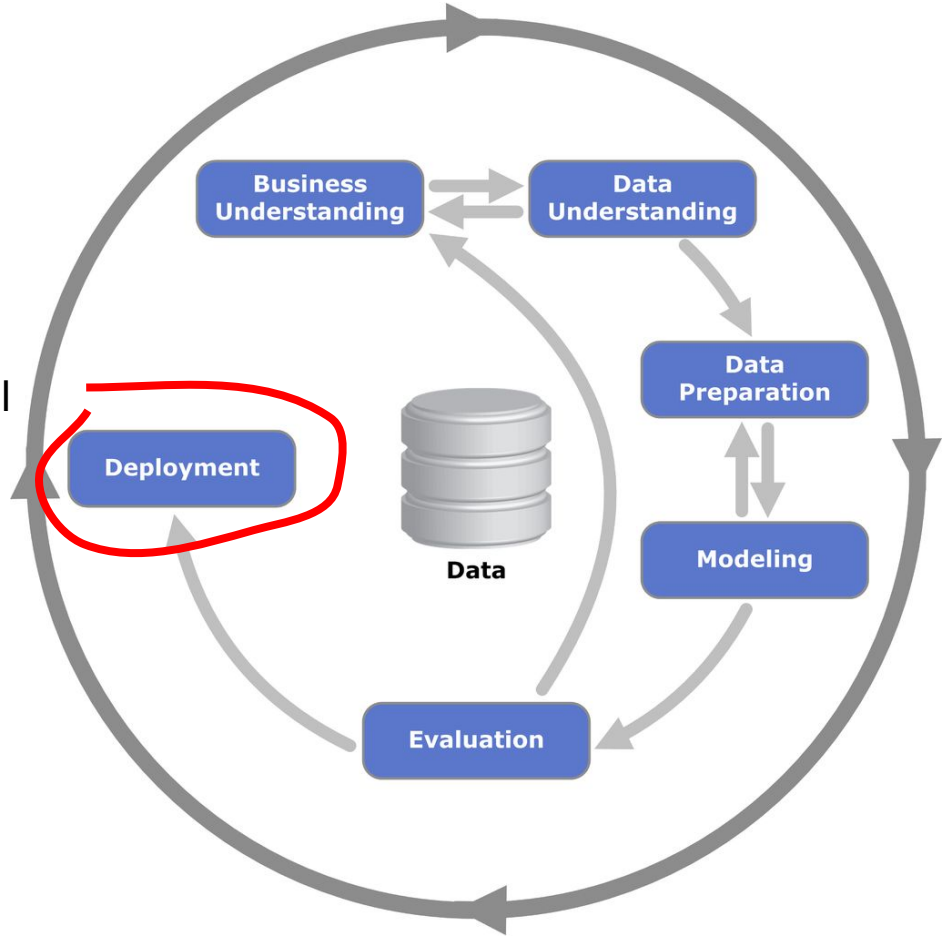
Picture: CRISP-DM



Measure how well the model solves the business problem

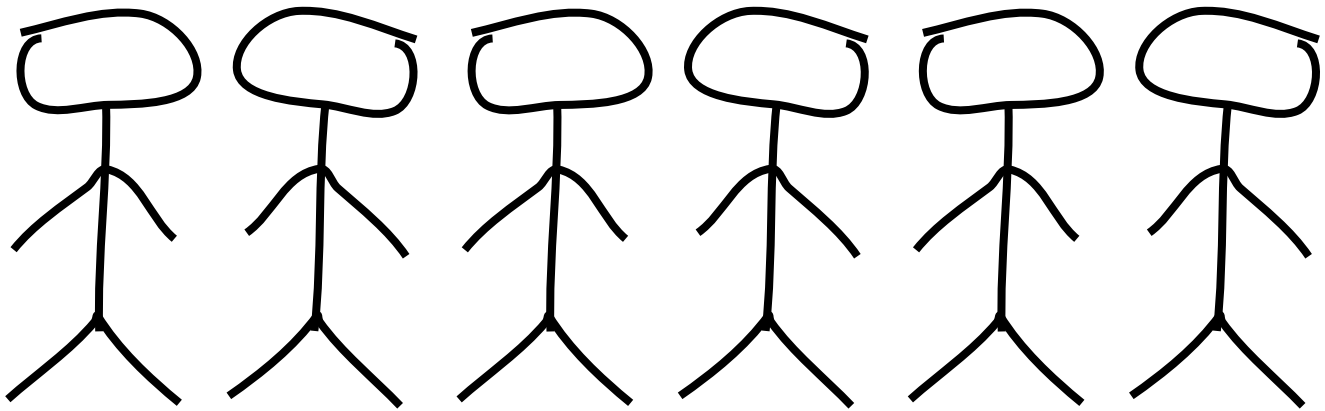
Picture: CRISP-DM

Deploy the model to production



Picture: CRISP-DM

We need a team for that!



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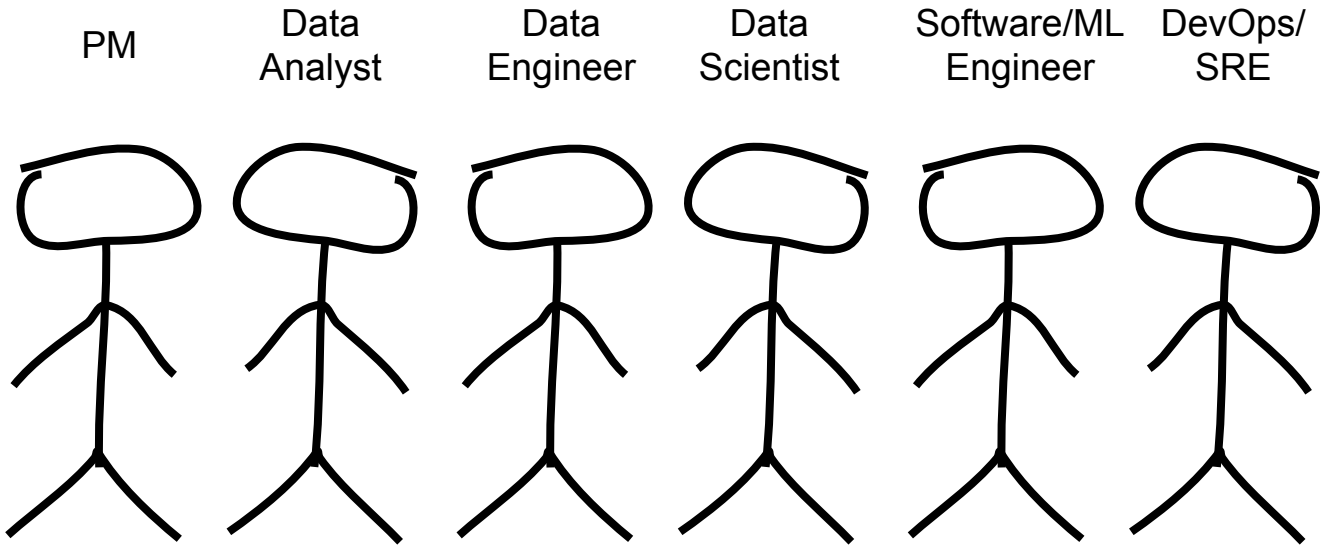
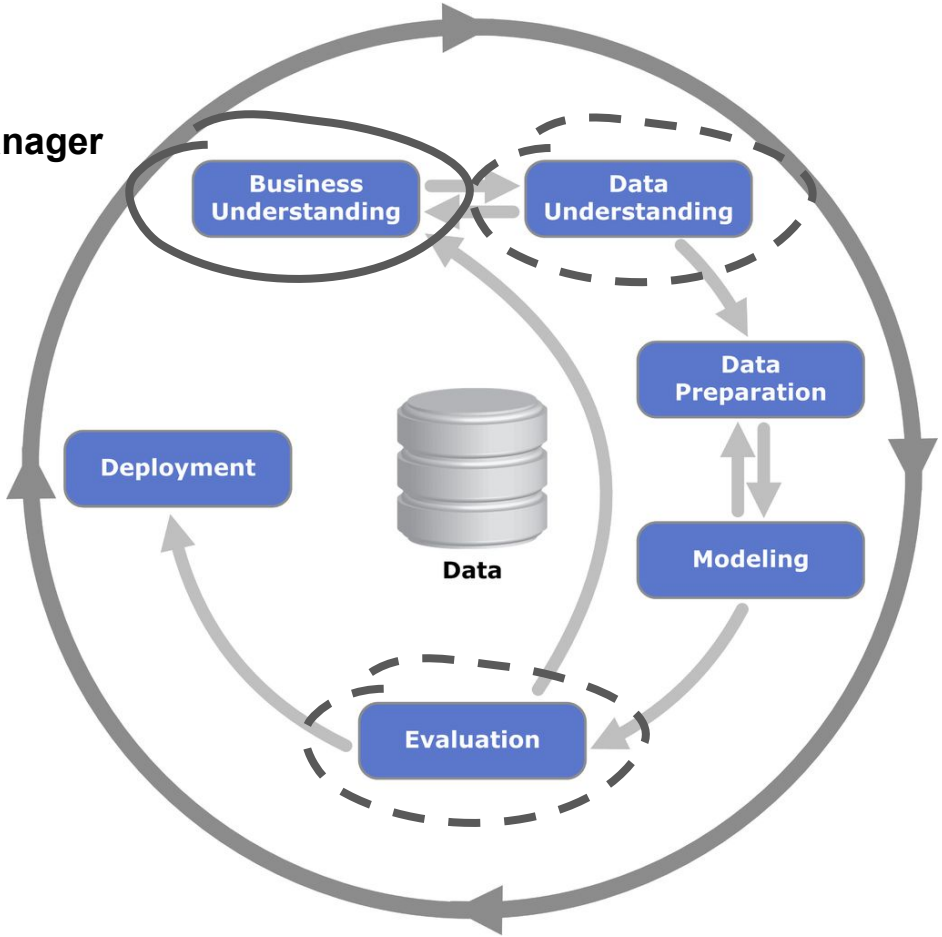
- **Roles in the team**
- Full-stack data scientist: Jack of all trades
- Becoming full-stack


PM
Data Analyst
Data Engineer
Data Scientist
Software/ML Engineer
DevOps/ SRE

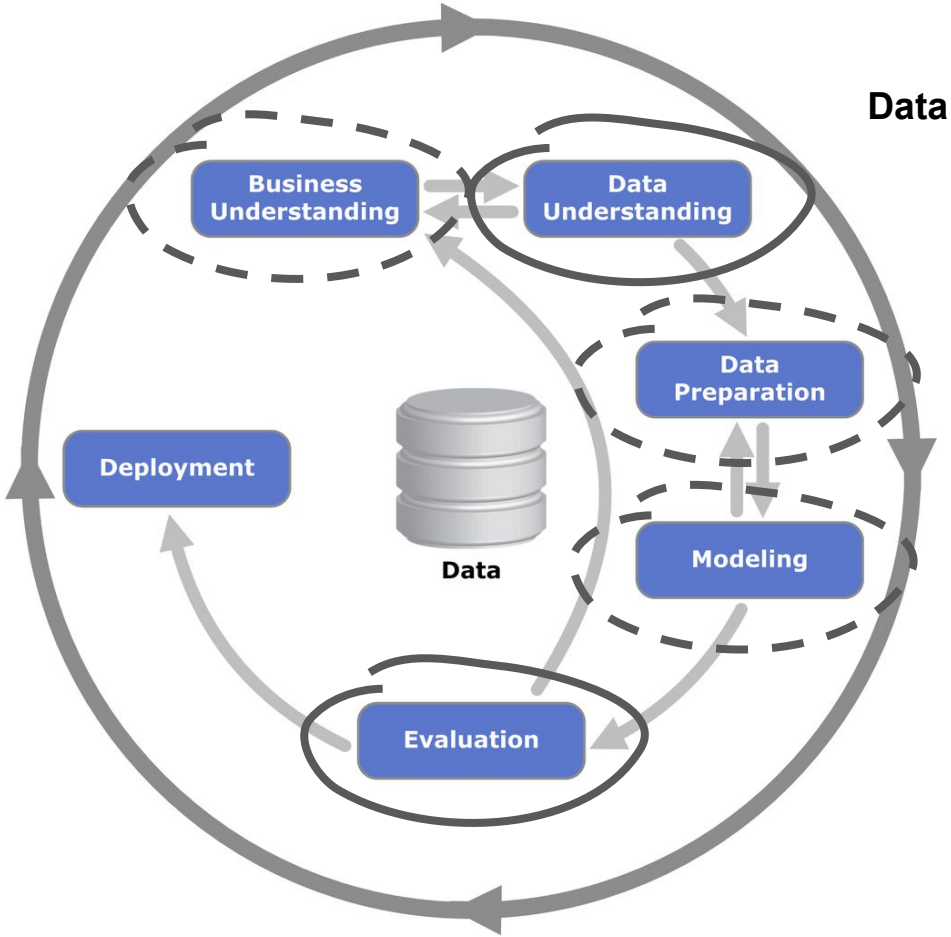

Business Understanding
Data Understanding
Data Preparation
Modeling
Evaluation
Deployment
Data

Product Manager



Picture: CRISP-DM

Data Analyst



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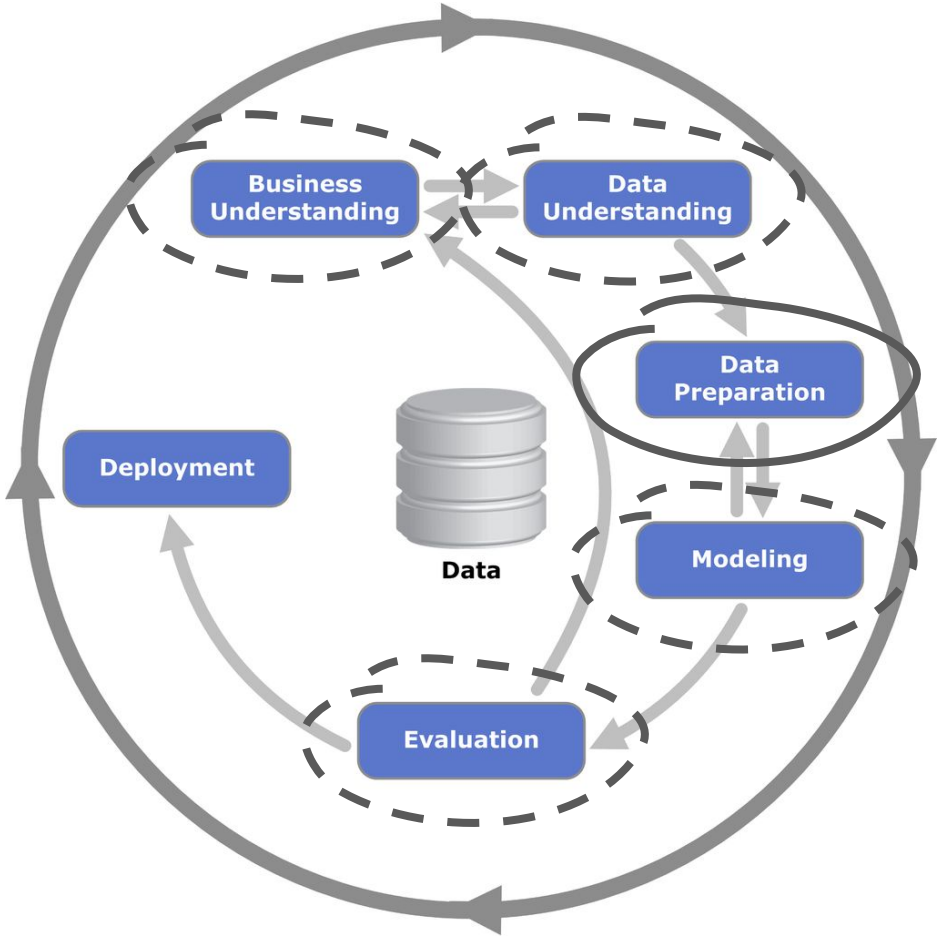
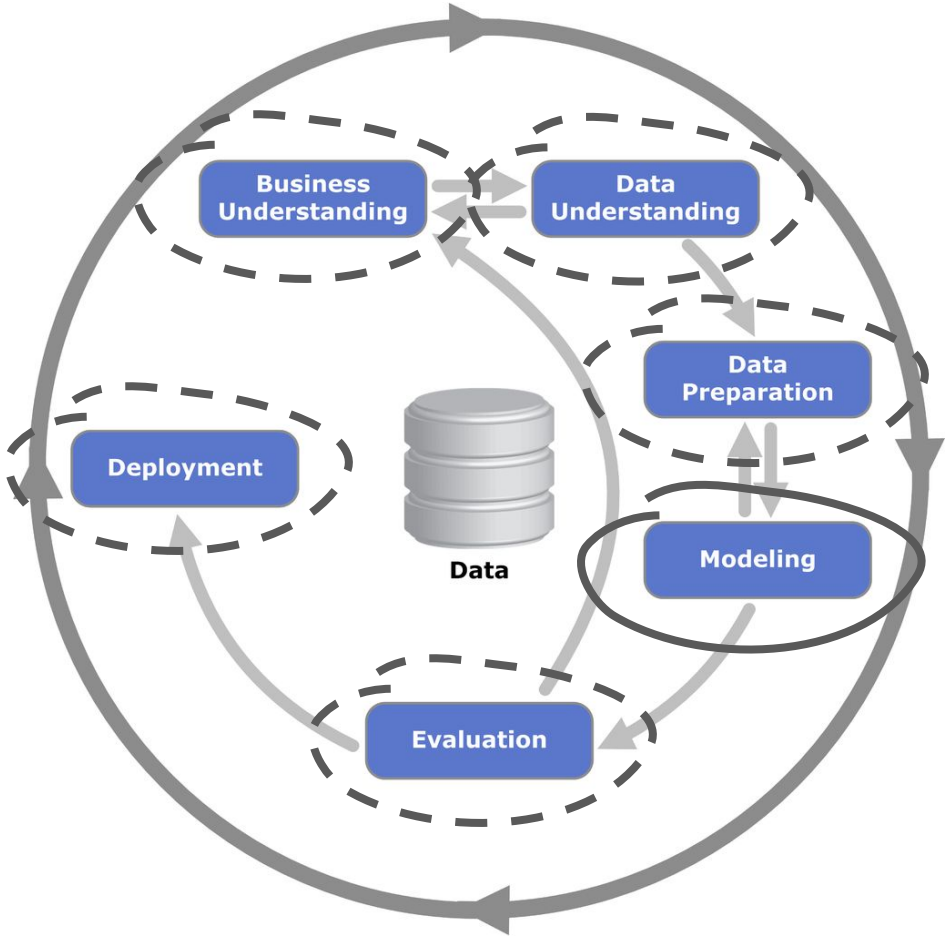


Data Engineer

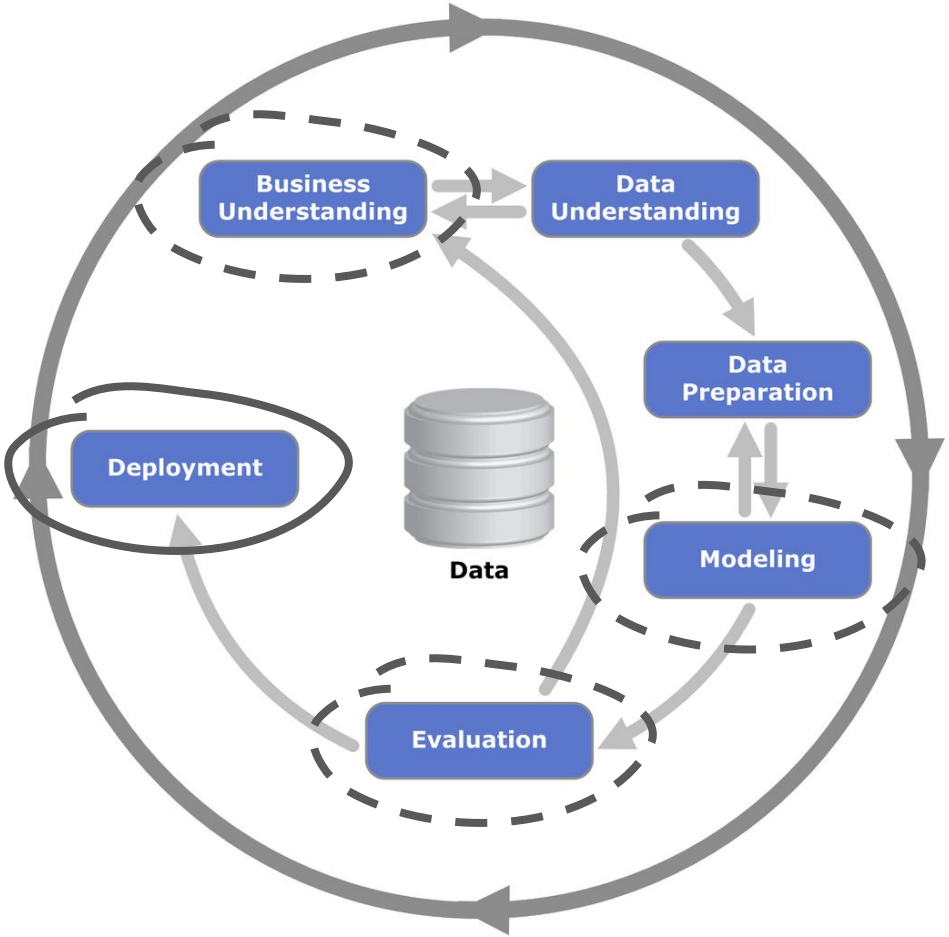
Picture: CRISP-DM



Data Scientist

Picture: CRISP-DM

ML Engineer



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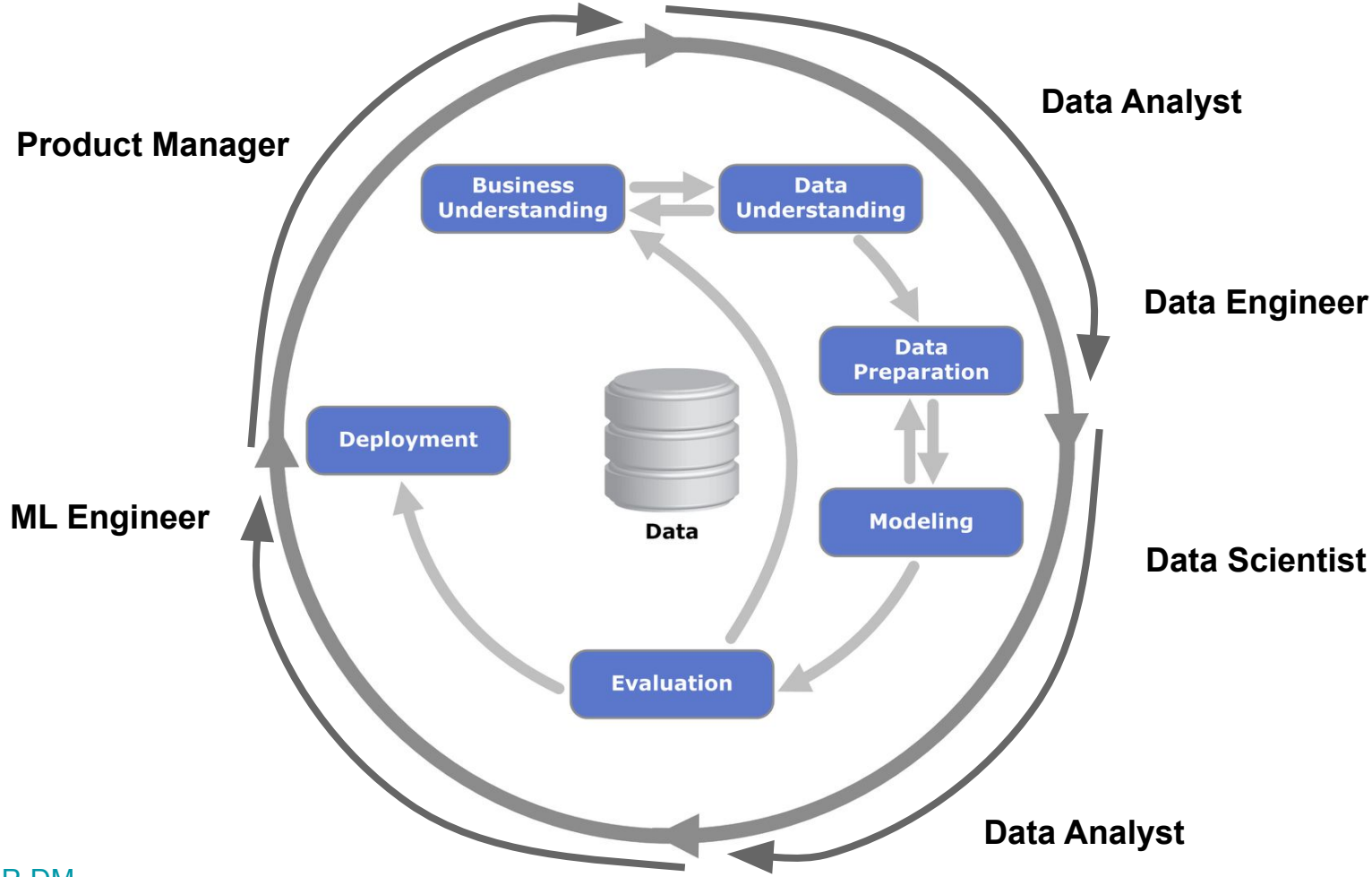

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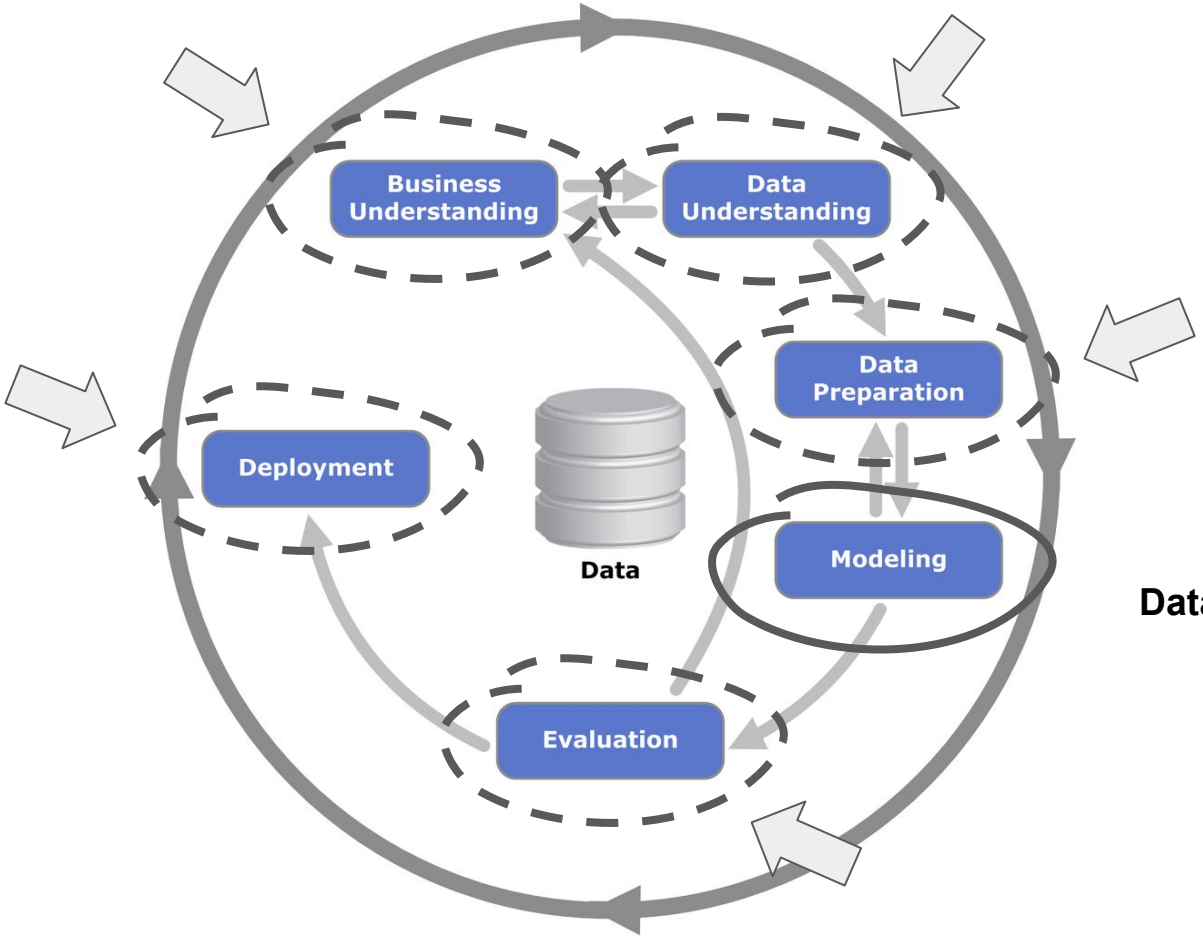

Data Scientist

Picture: CRISP-DM

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- **Full-stack data scientist: Jack of all trades**
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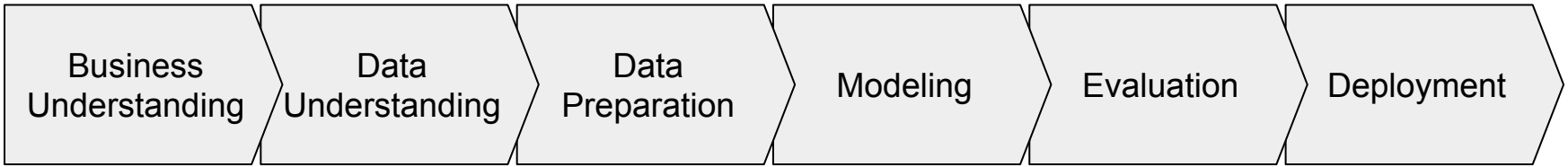
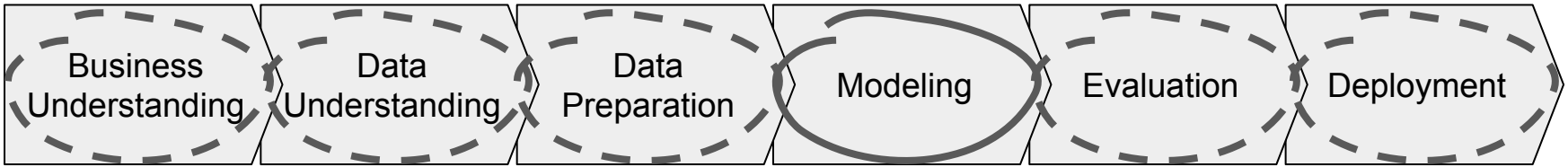

Business Understanding
Data Understanding
Data Preparation
Modeling
Evaluation
Deployment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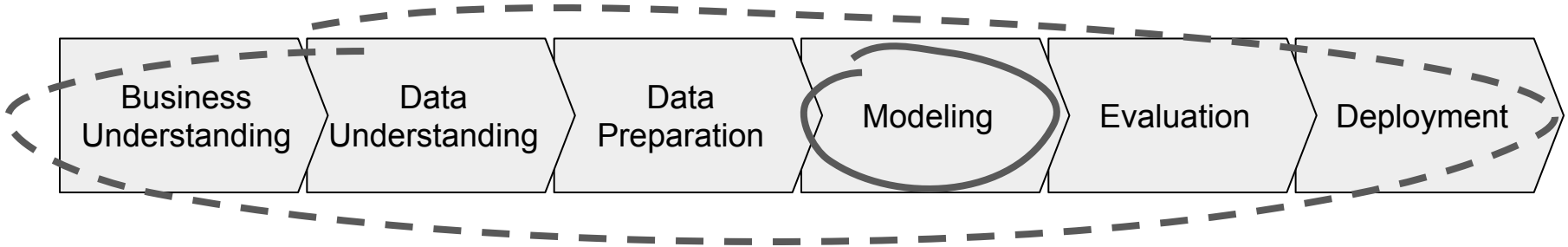
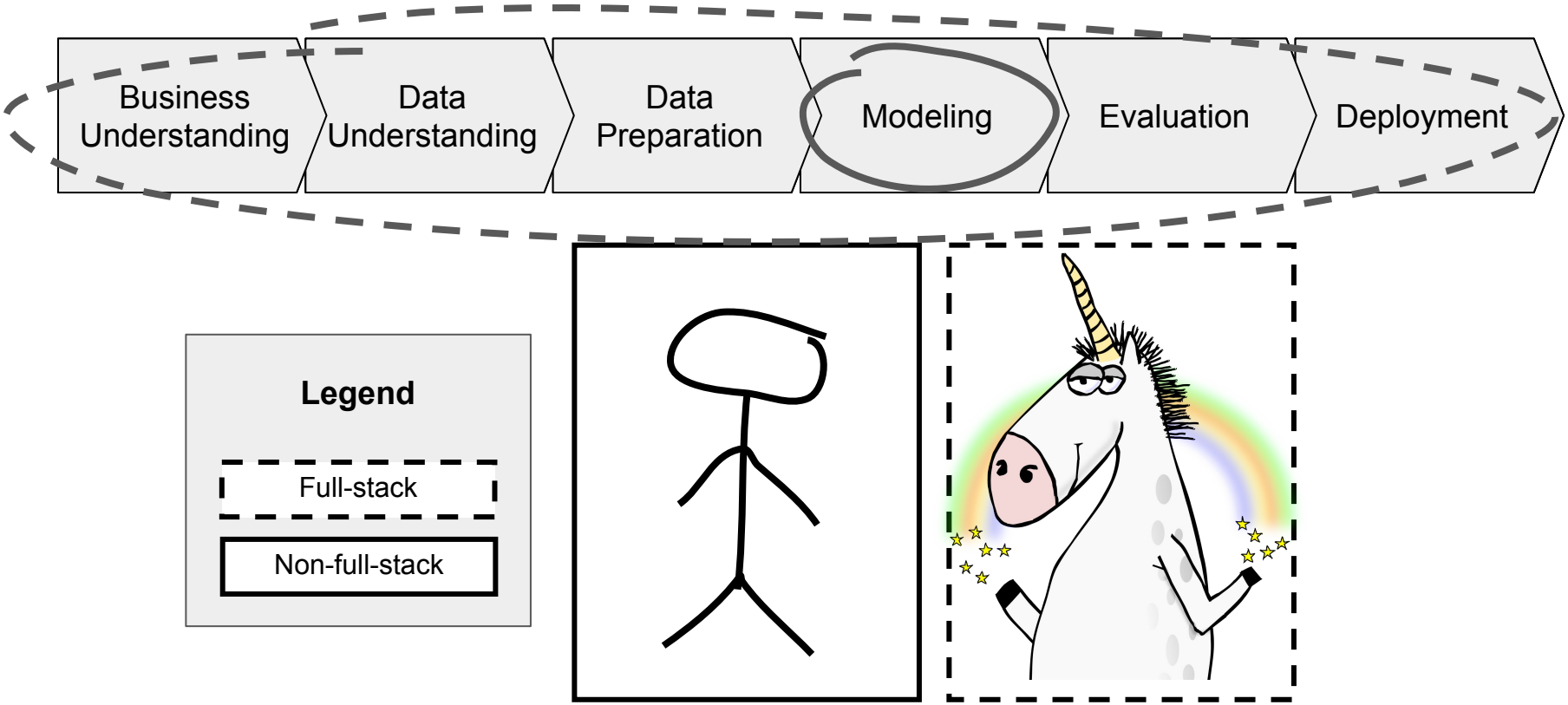


Legend

Full-stack

Non-full-stack


Business Understanding
Data Understanding
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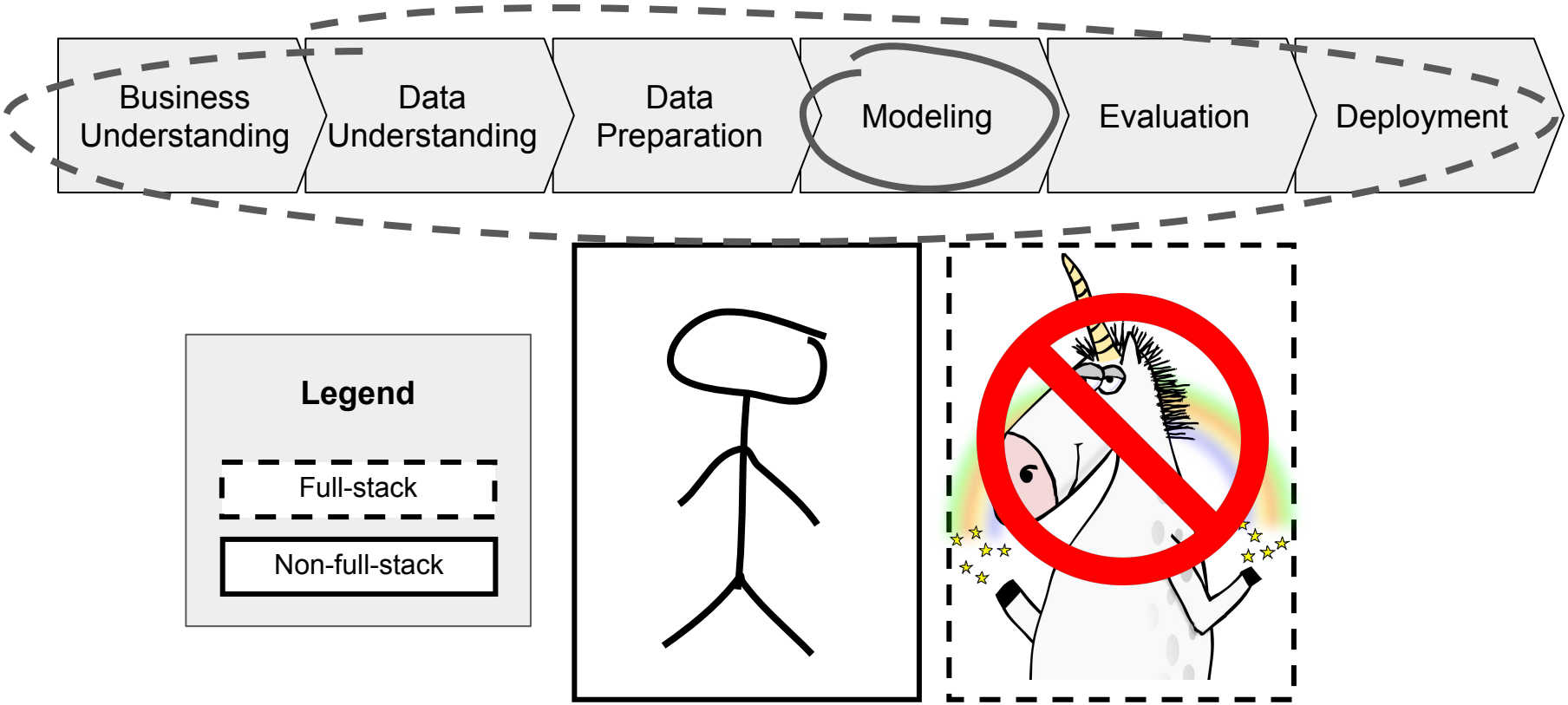
Evaluation
Deployment
Legend
Full-stack
Non-full-stack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Full-stack
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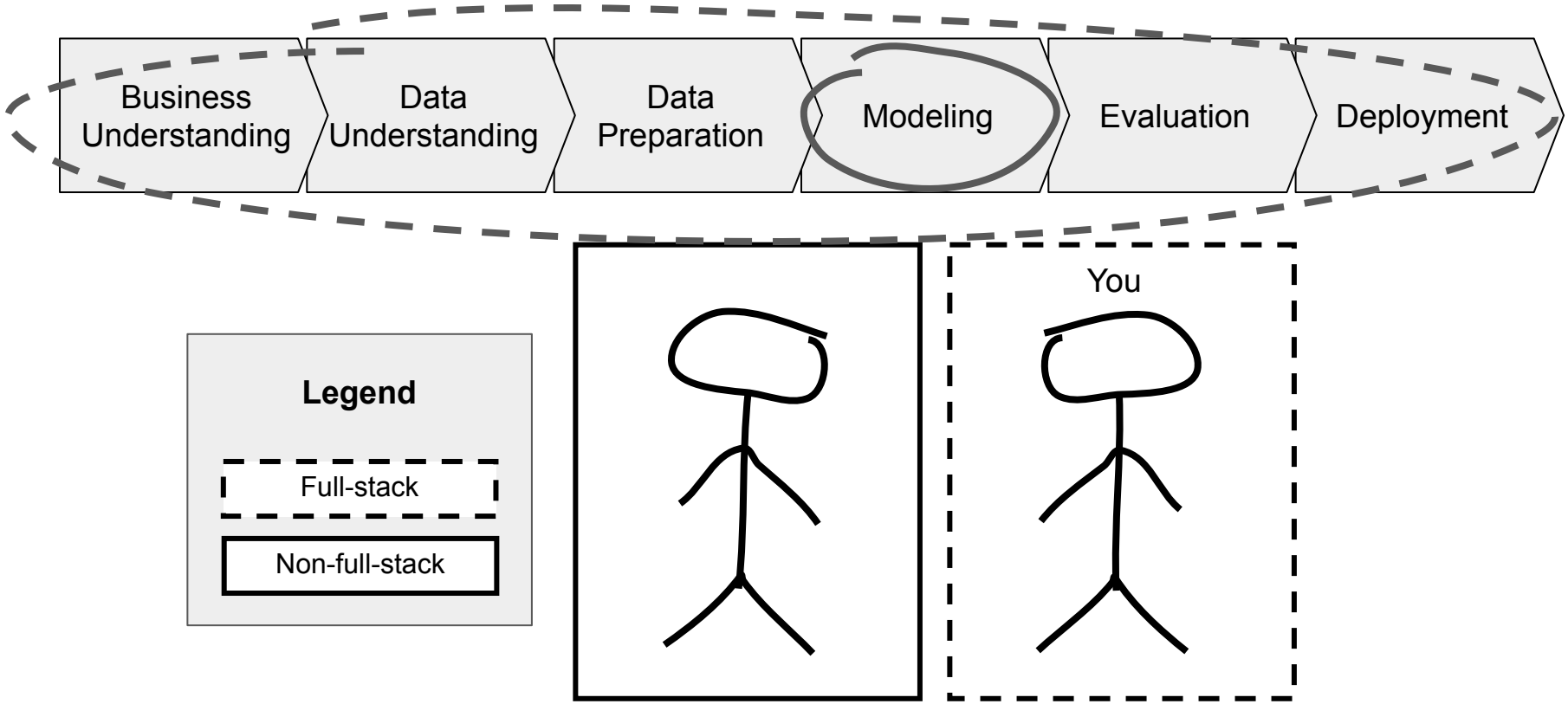
Business Understanding
Data Understanding
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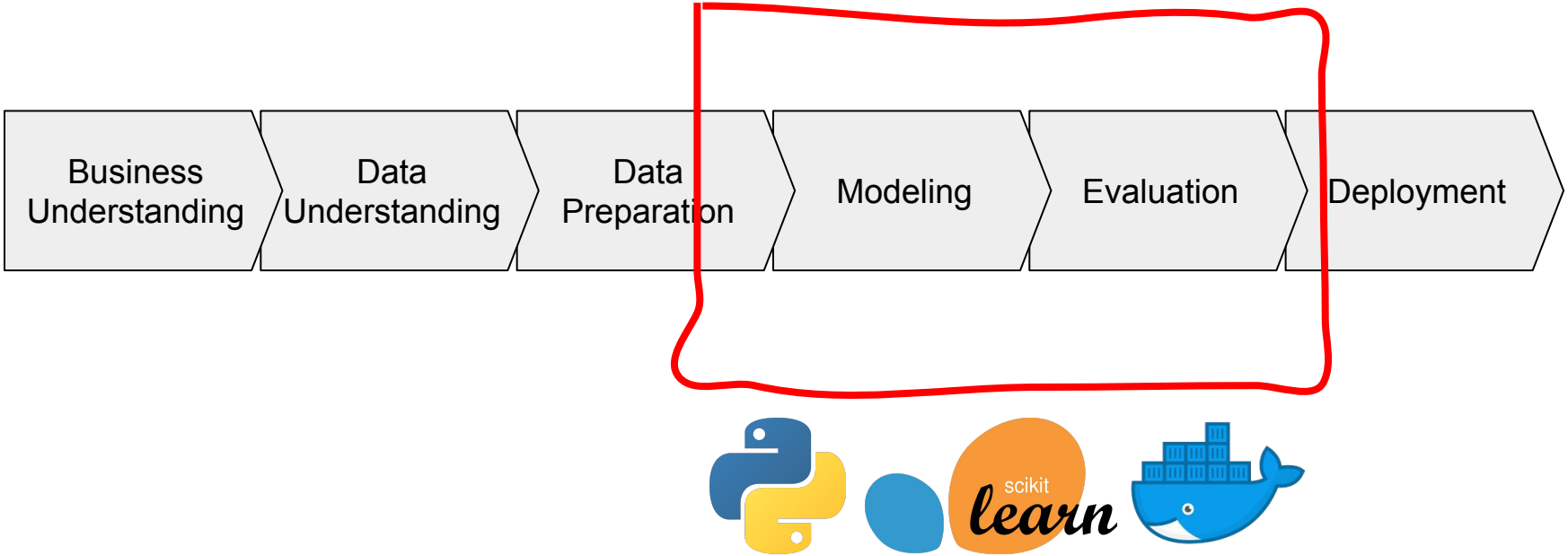
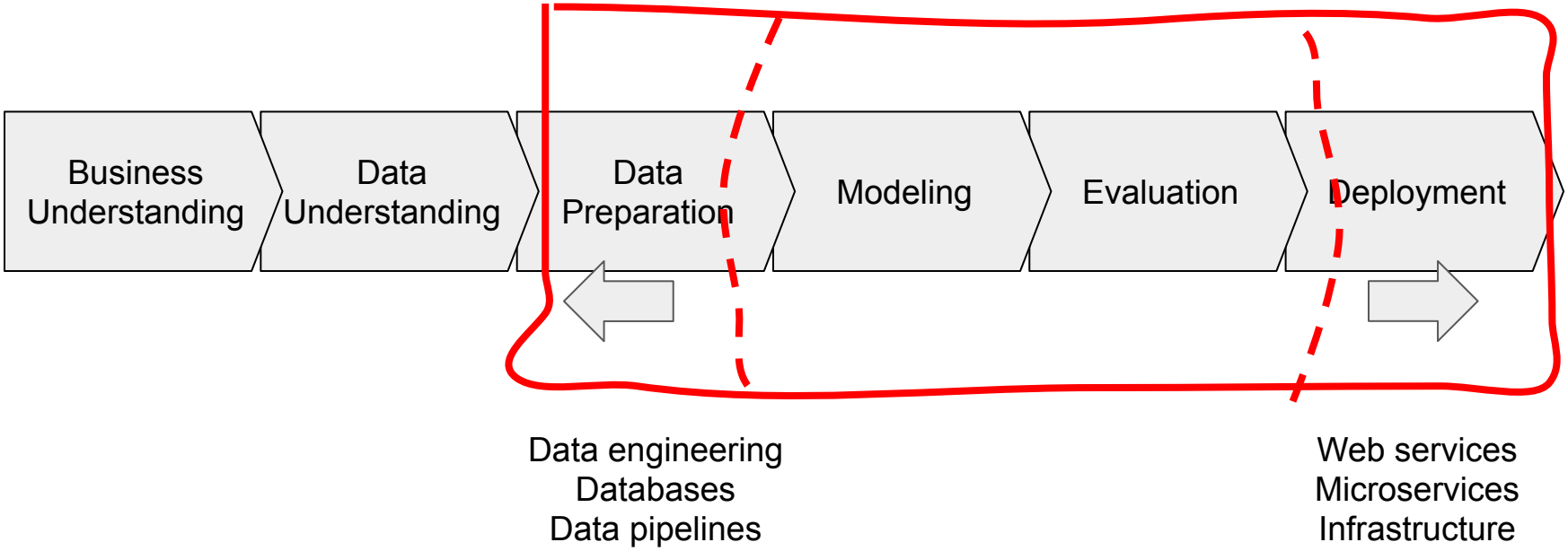
Evaluation
Deployment
Legend
Full-stack
Non-full-stack
You

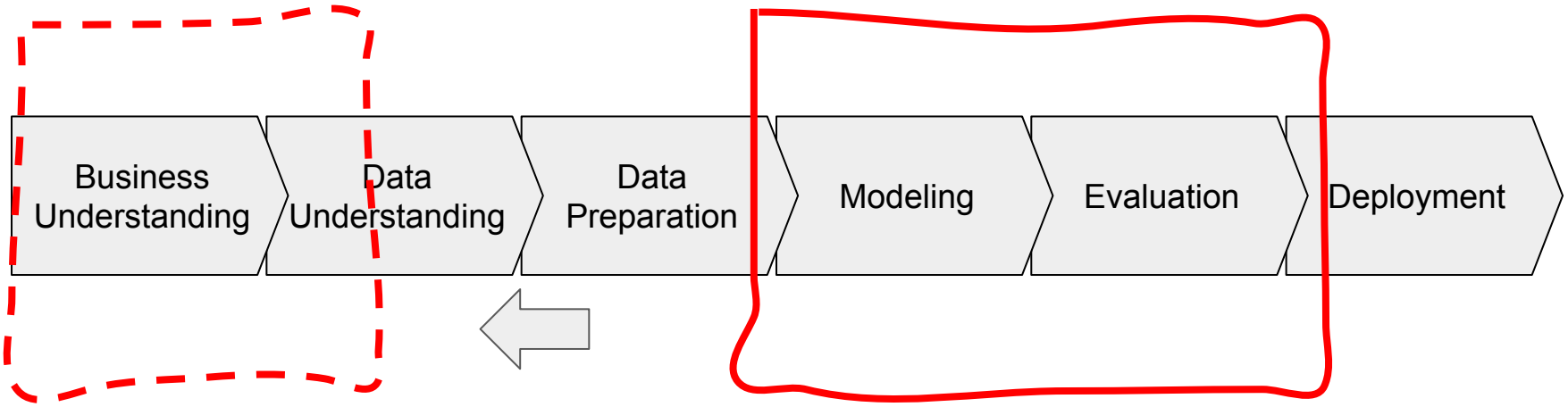
Core data science



Software engineering



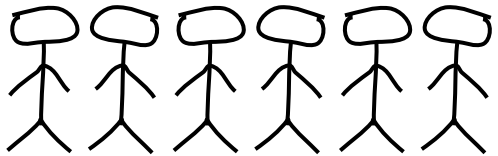
Product management



Product management
Domain expertise
Data analysis
Communication

We need to learn

- Product management
- Data analysis
- Data engineering
- Backend engineering
- DevOps
- …



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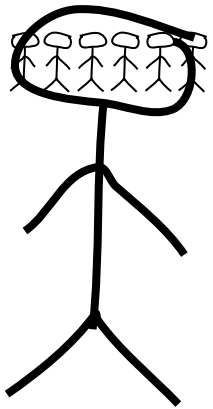

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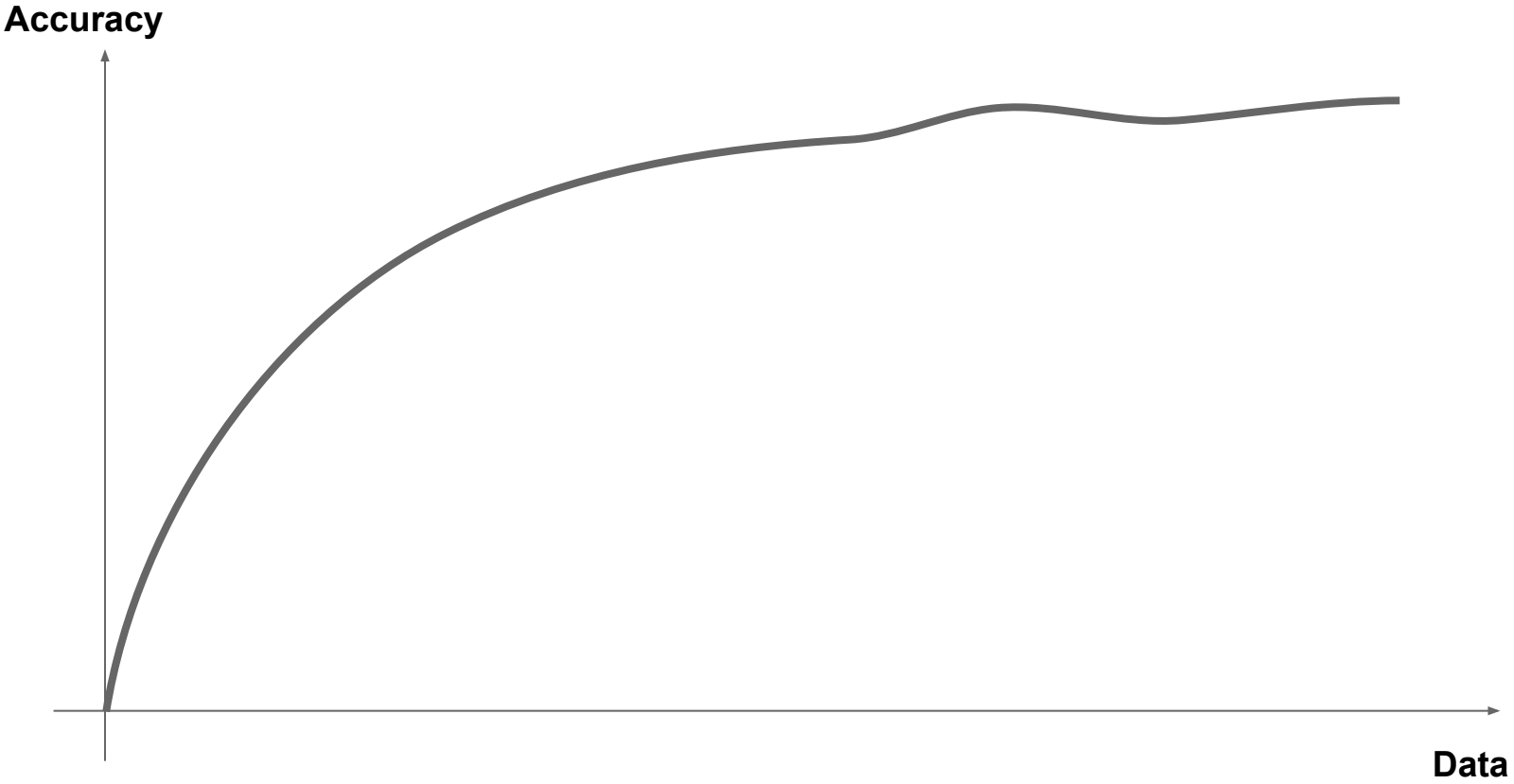
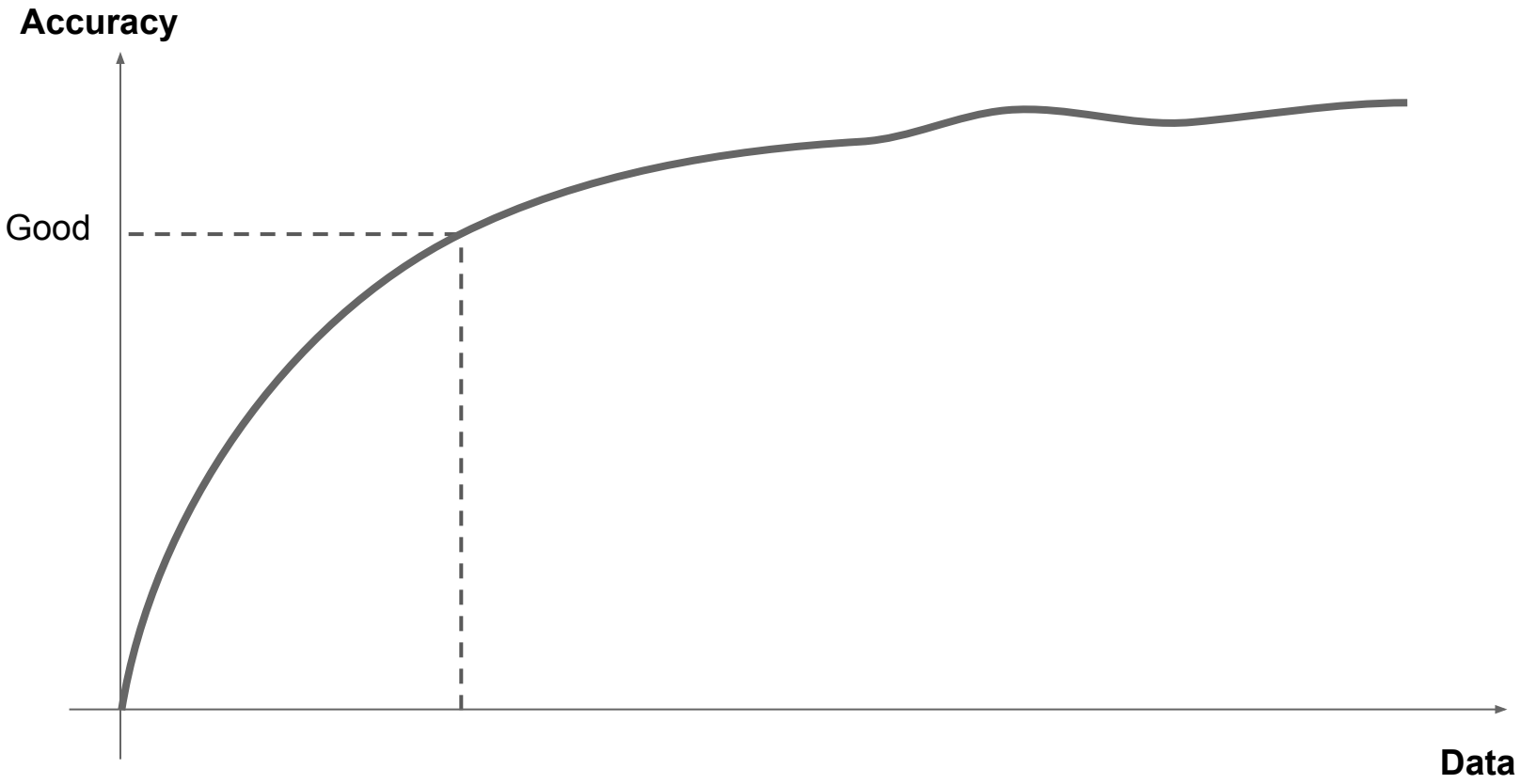
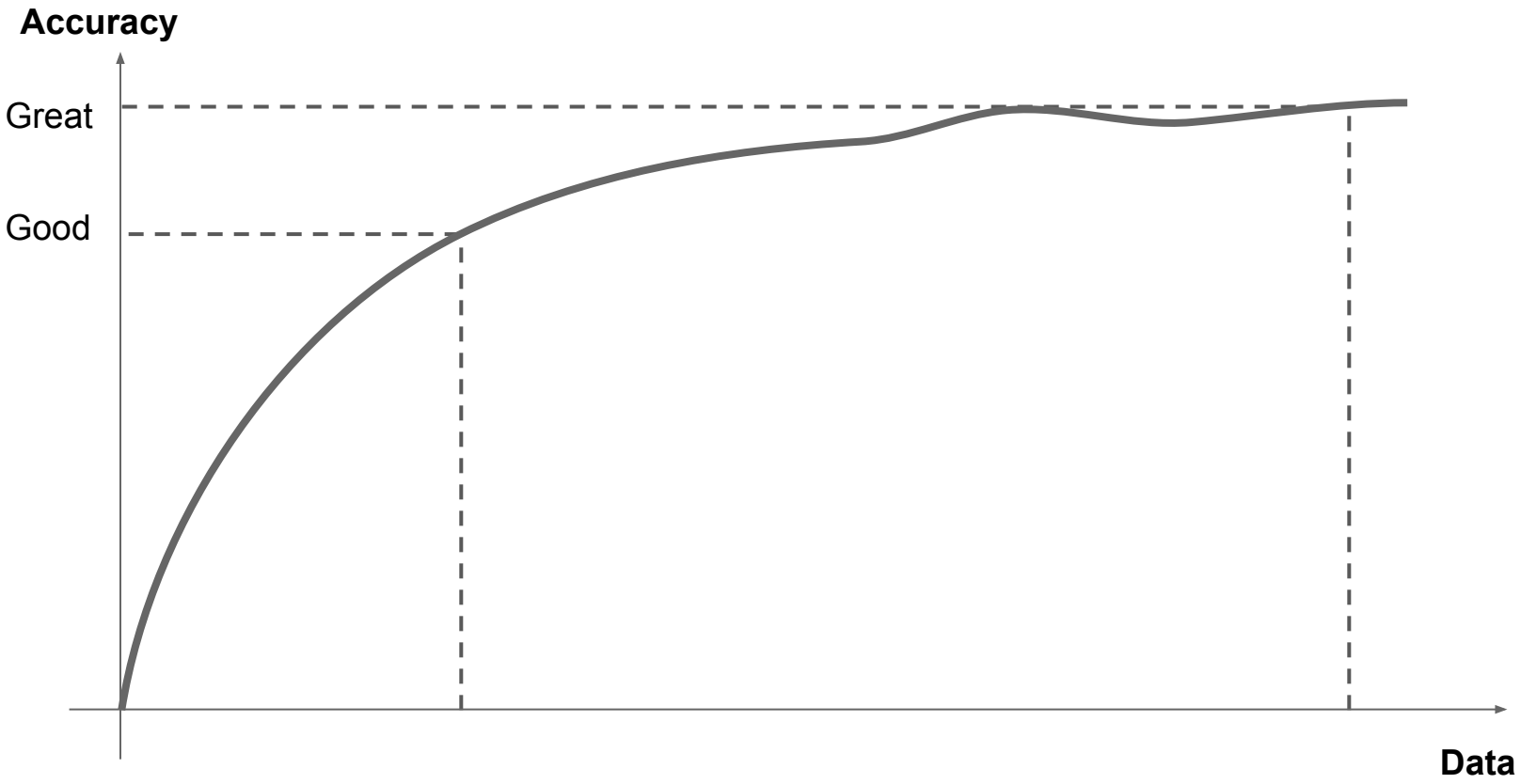

Accuracy
Data


Accuracy
Good
Data


Accuracy
Great
Good
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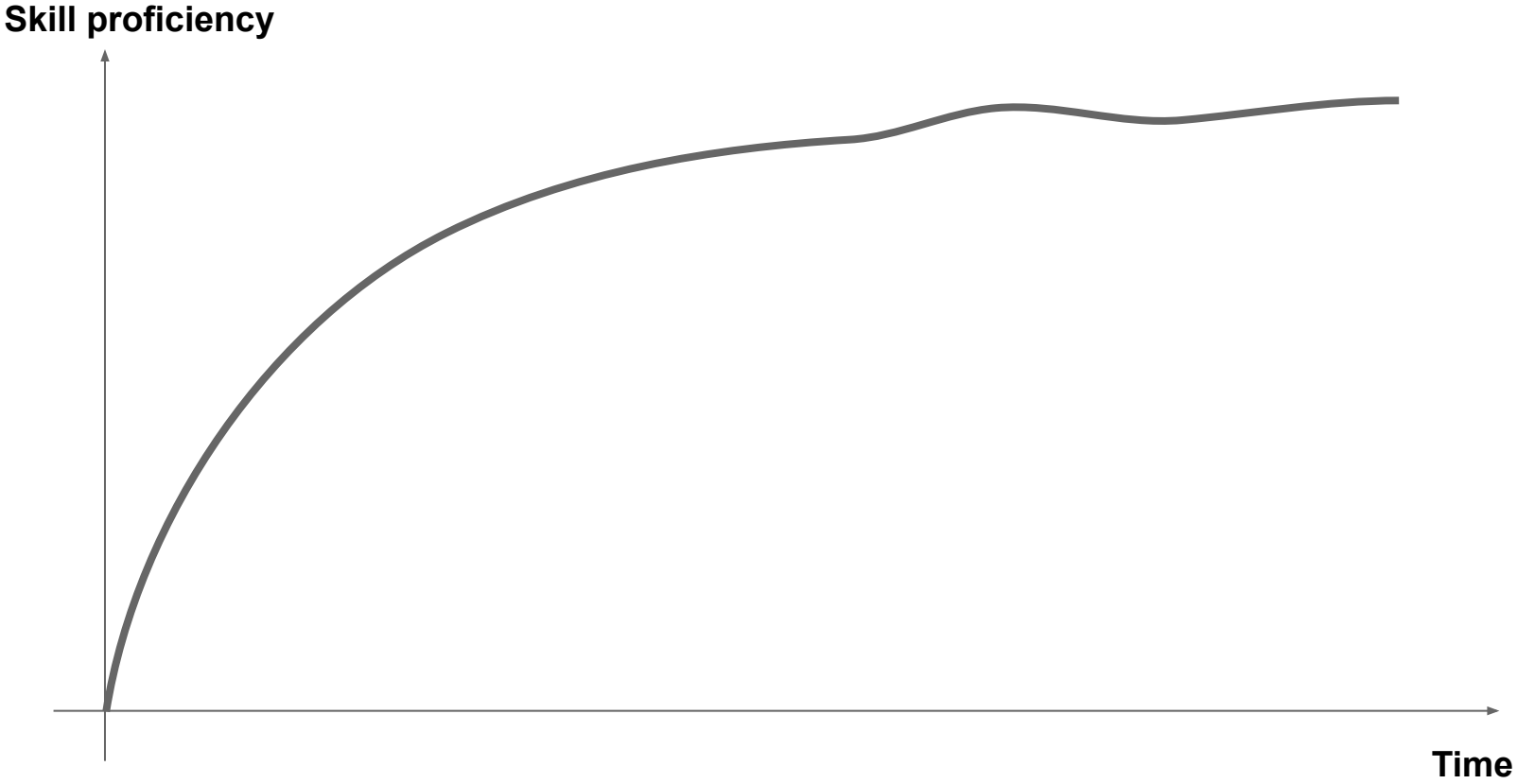
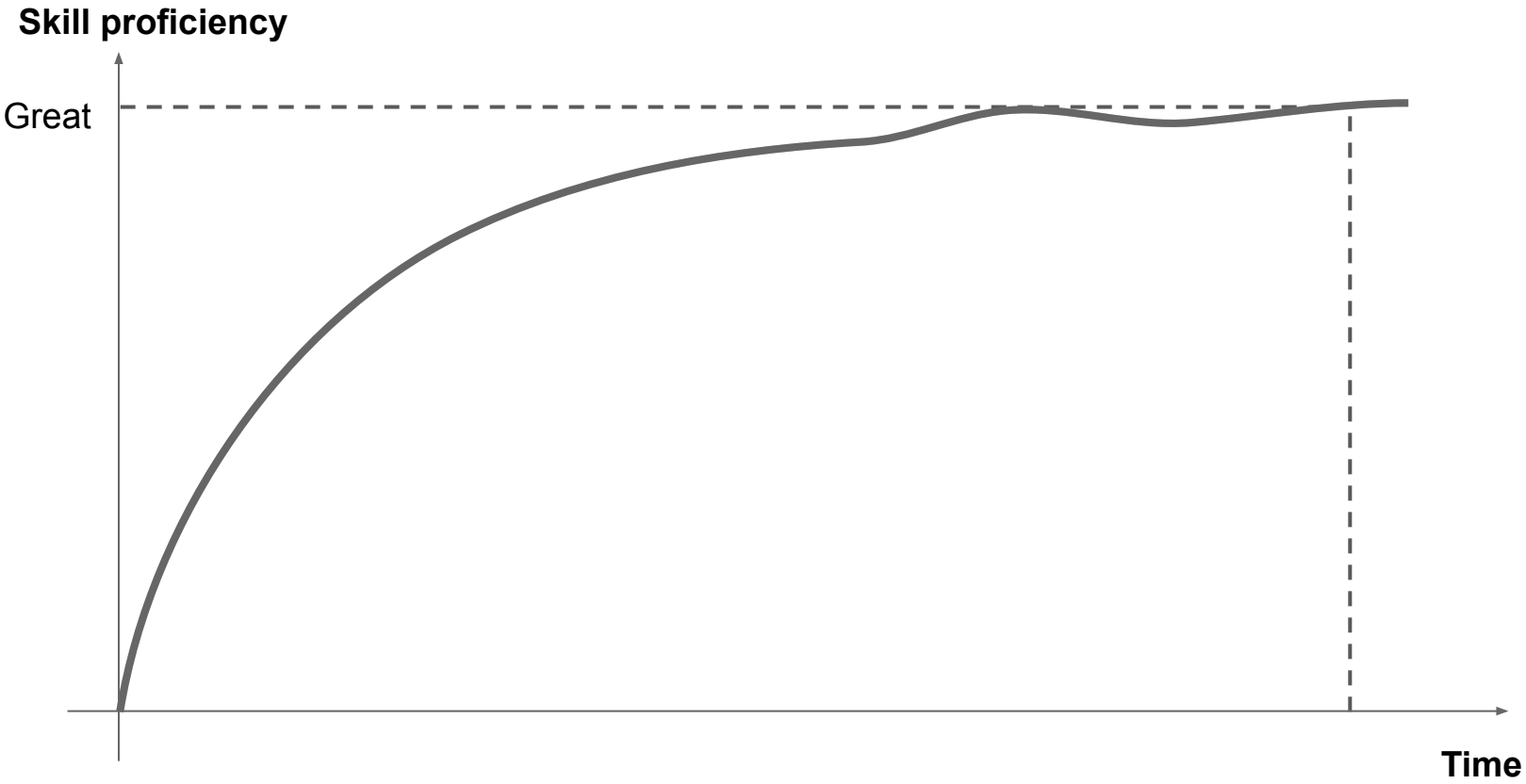
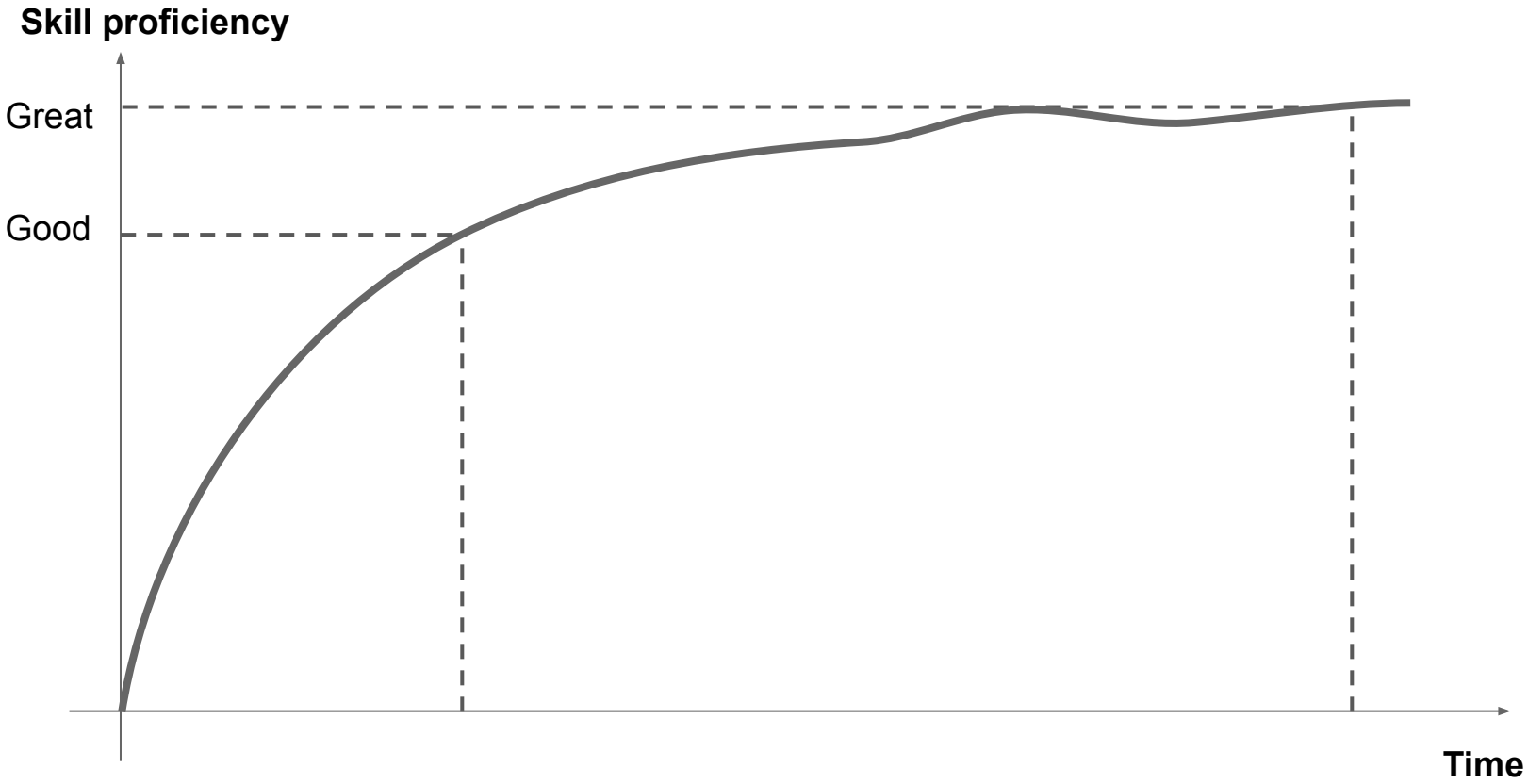
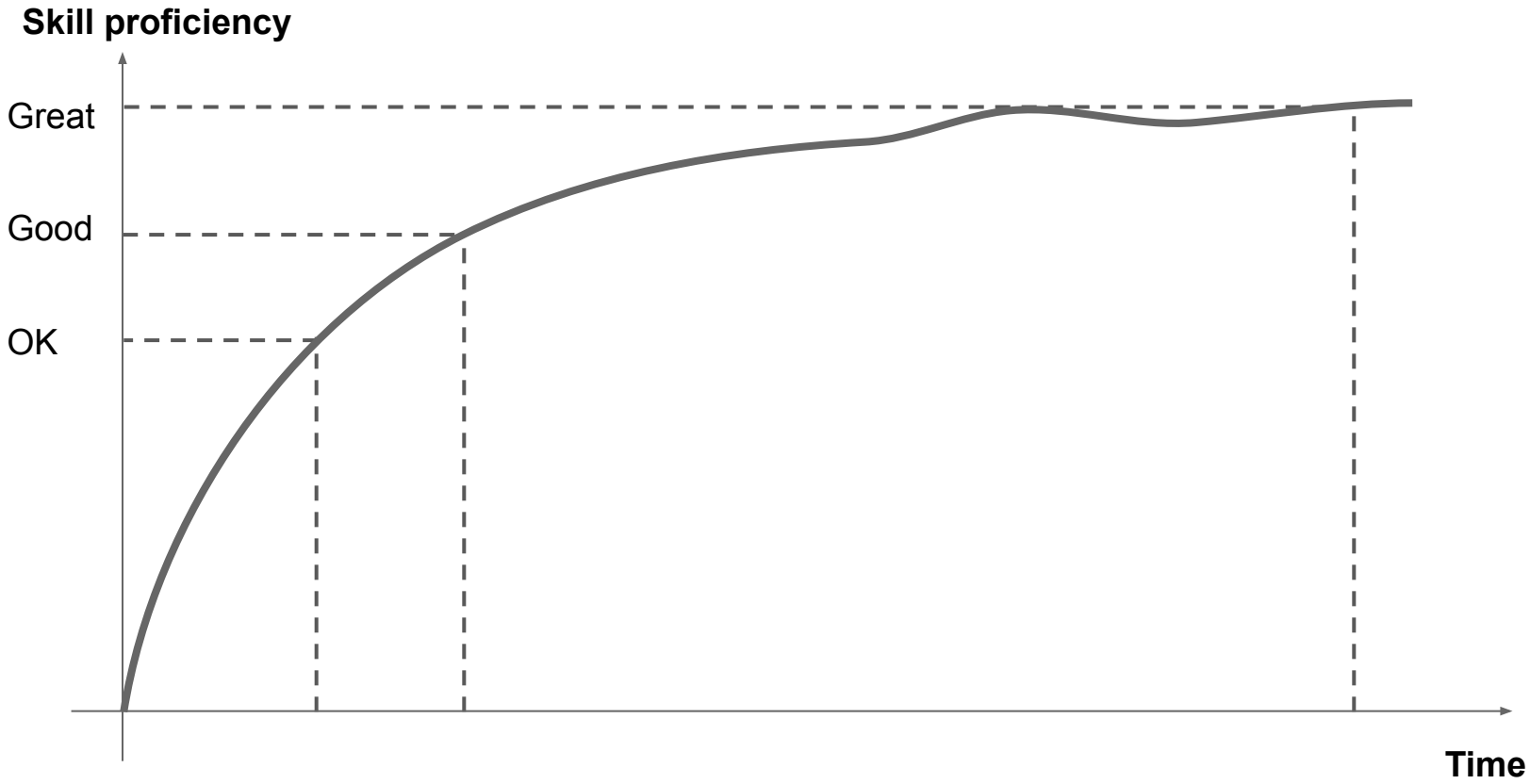

Skill proficiency
Time


Skill proficiency
Great
Time

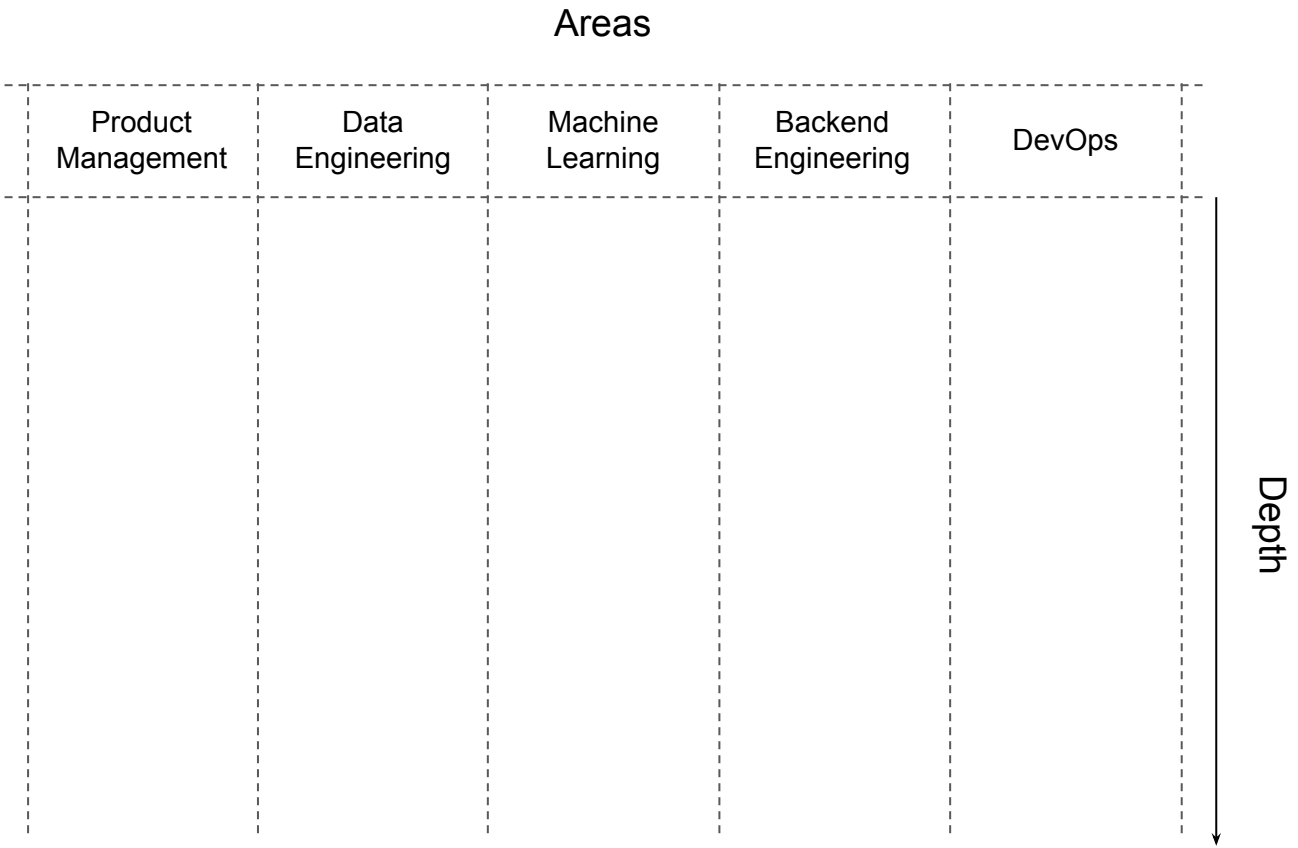

Skill proficiency
Great
Good
Time

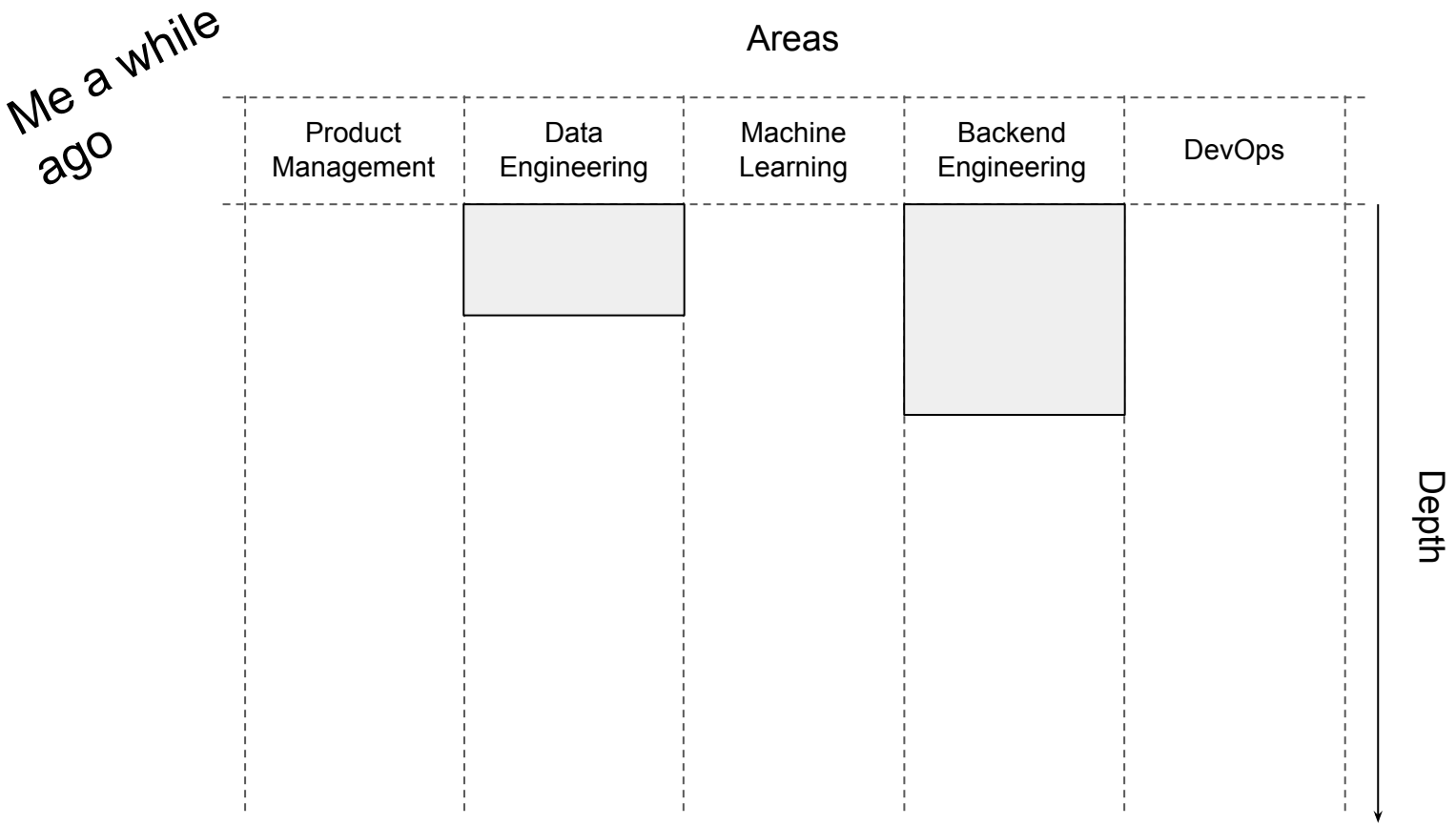

Skill proficiency
Great
Good
OK
Time

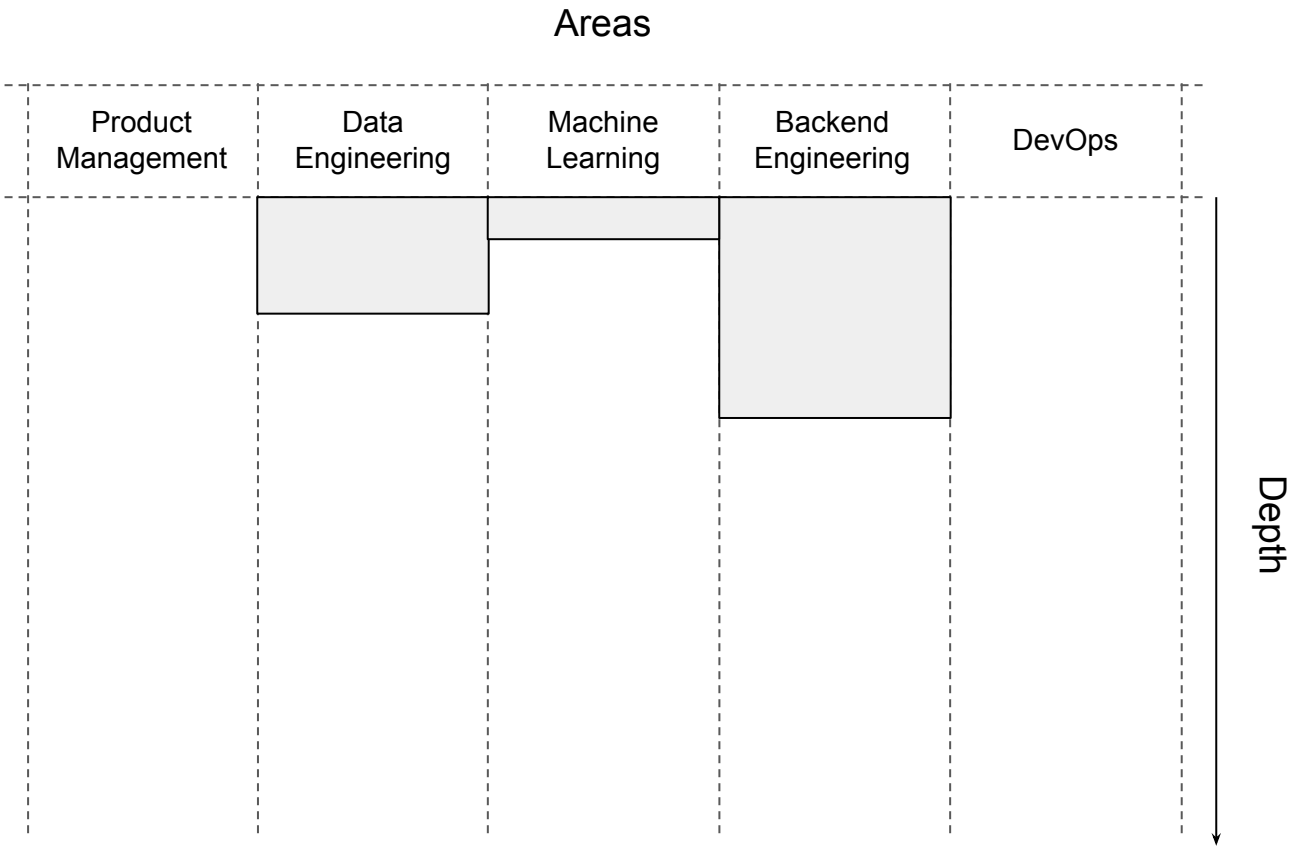
Skill proficiency

- OK — can use the skill, mostly independently
- Good — can use the skill independently
- Great — expert

We don’t need to be
experts in everything!


Areas
Product Management
Data Engineering
Machine Learning
Backend Engineering
DevOps
Depth


Me a while ago
Areas
Product Management
Data Engineering
Machine Learning
Backend Engineering
DevOps
Depth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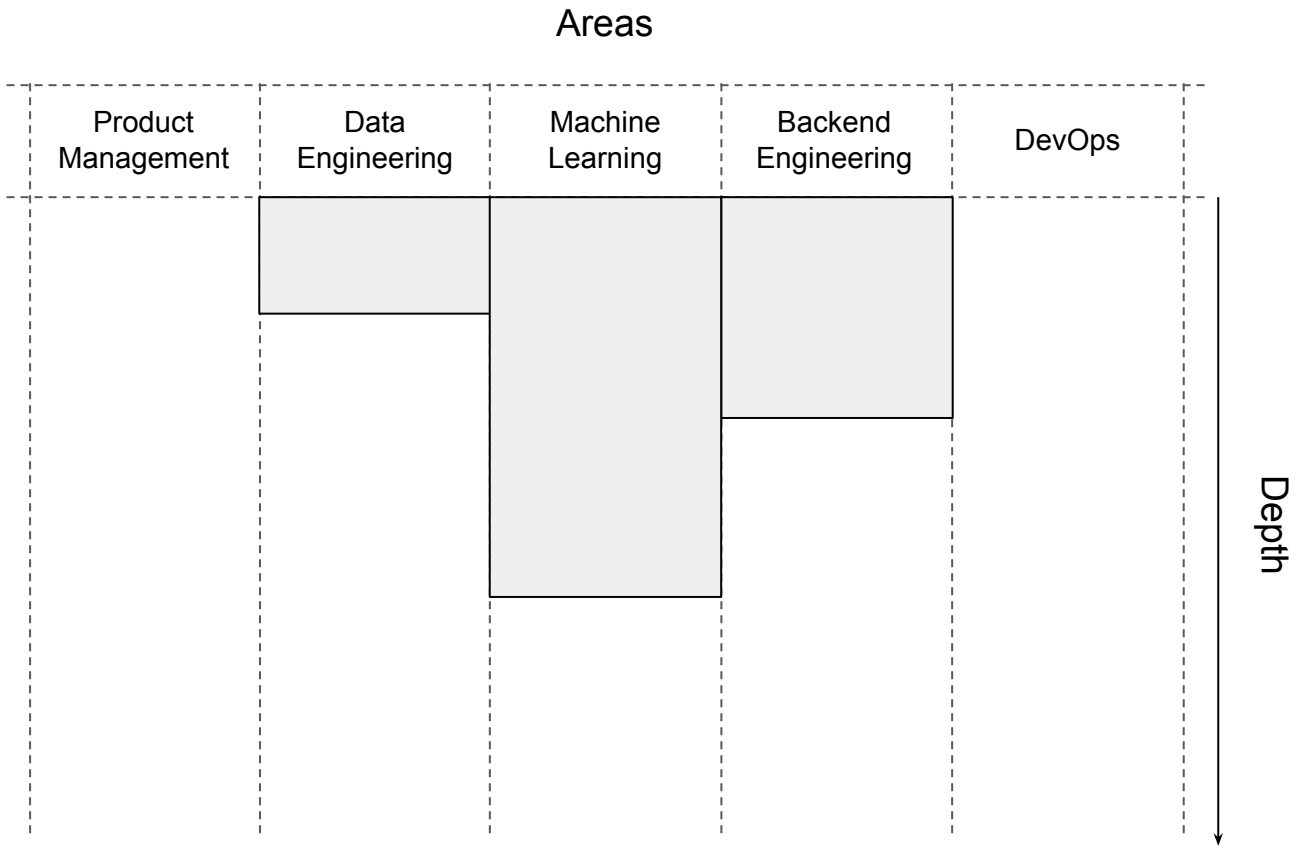
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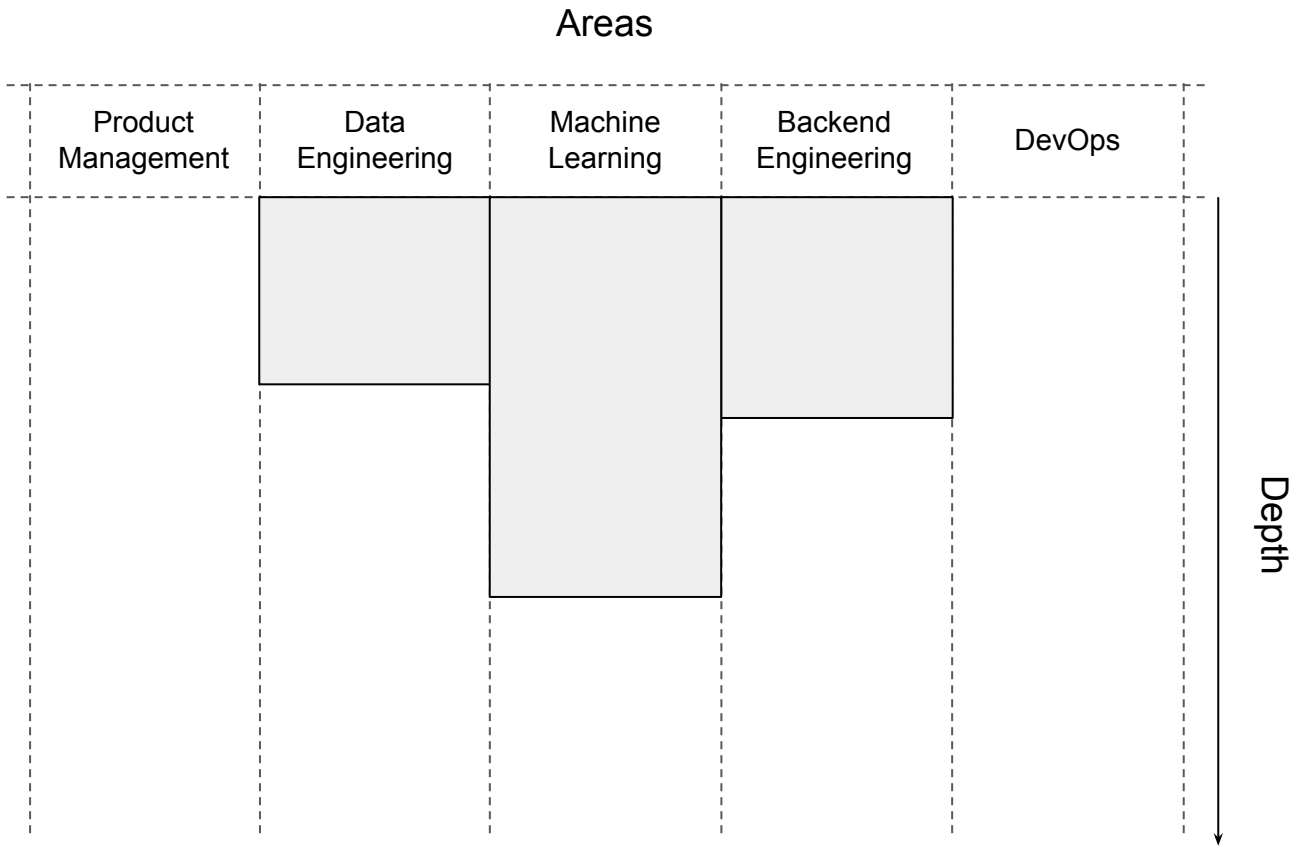
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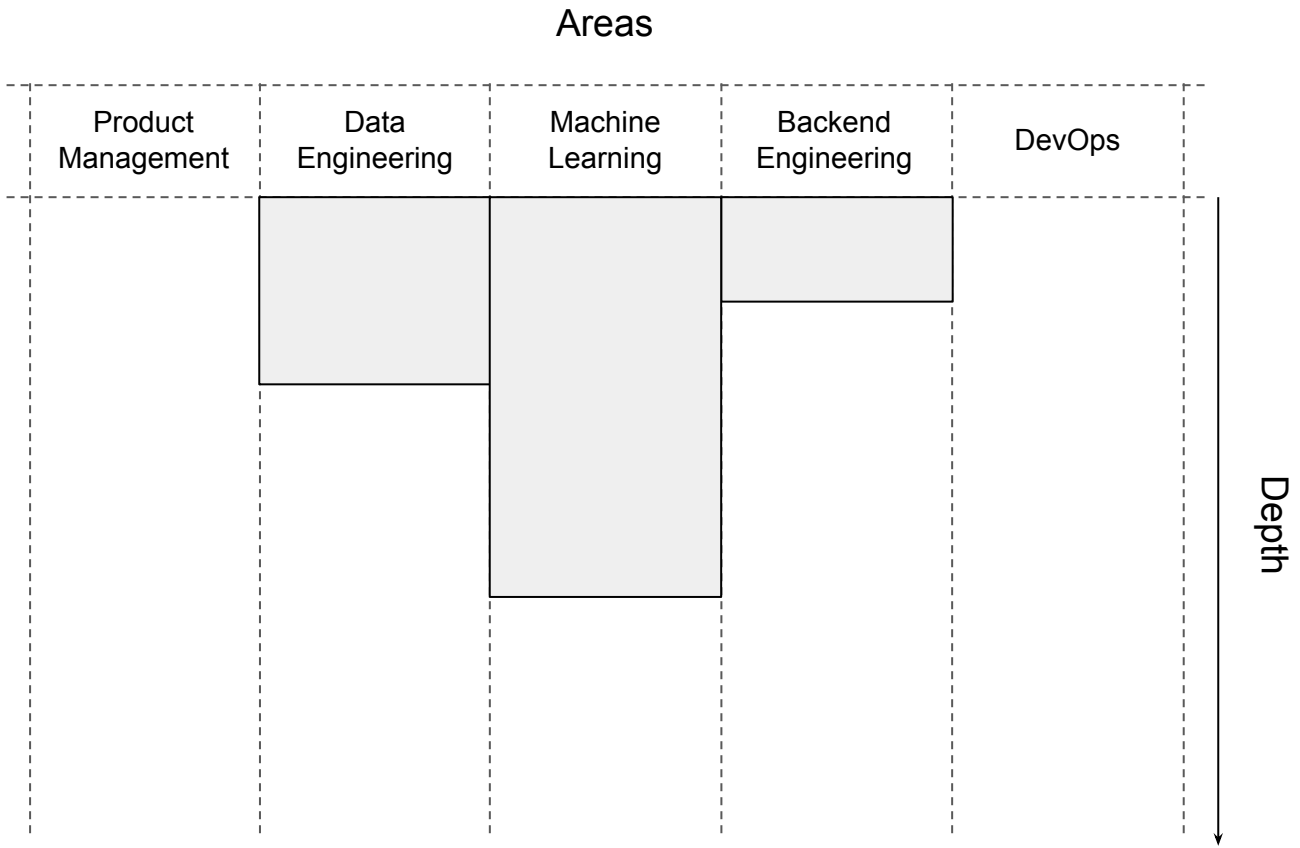
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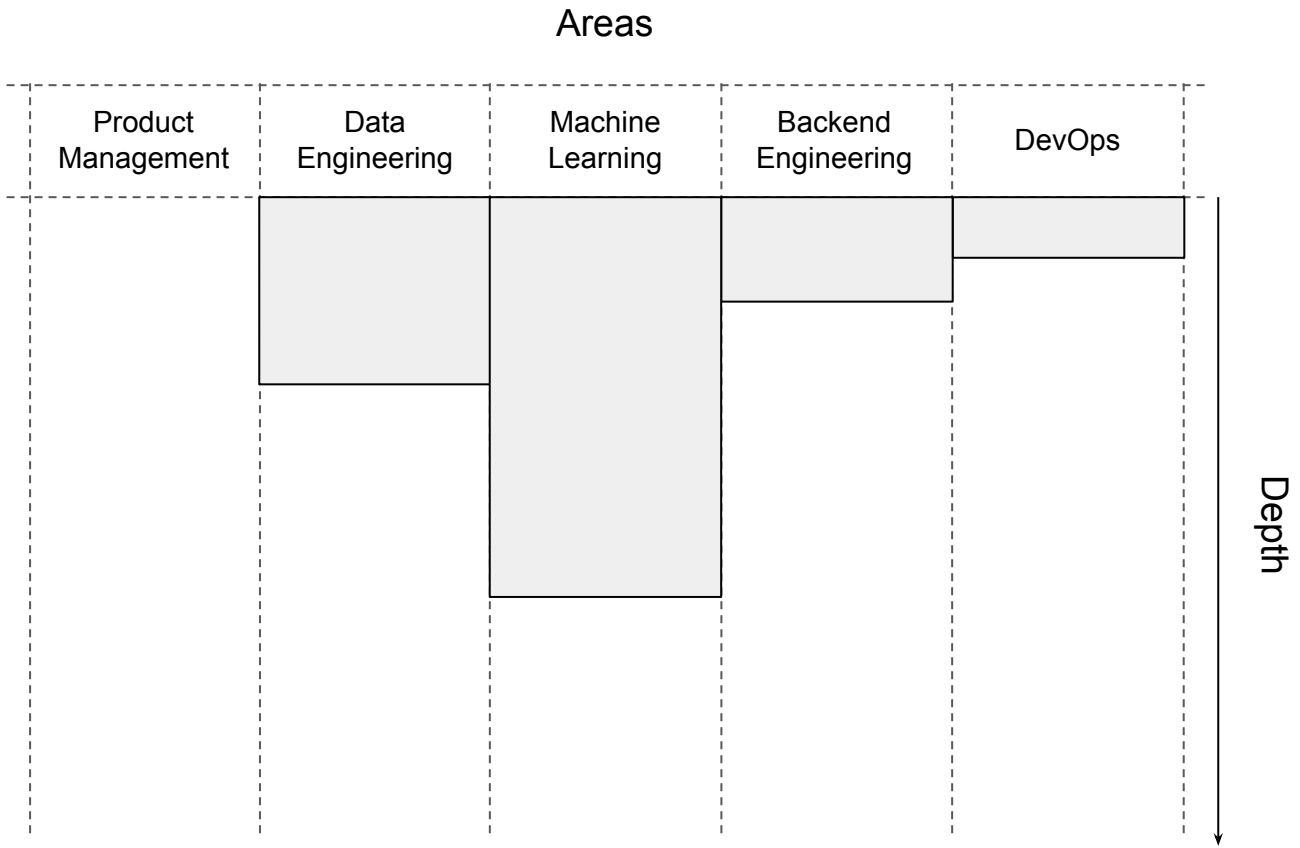
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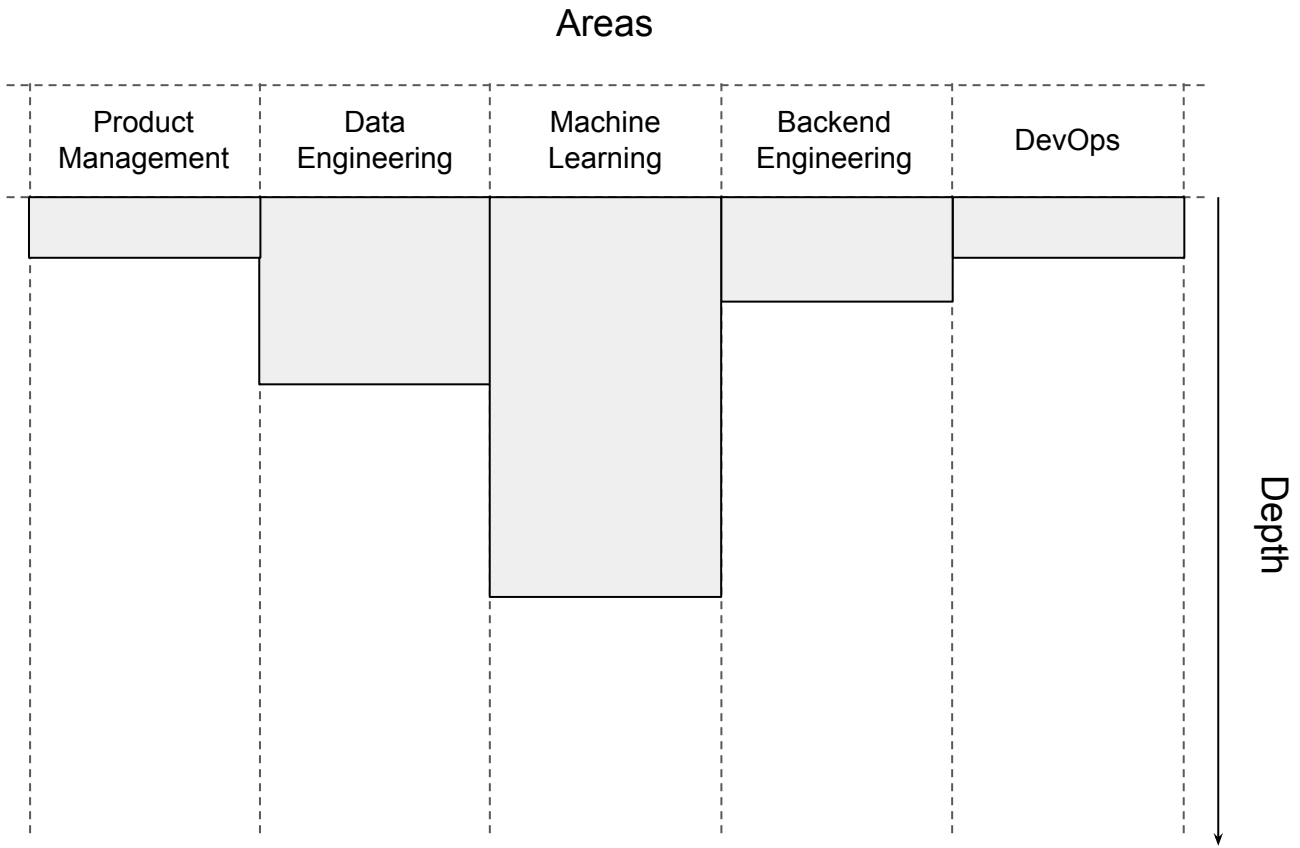
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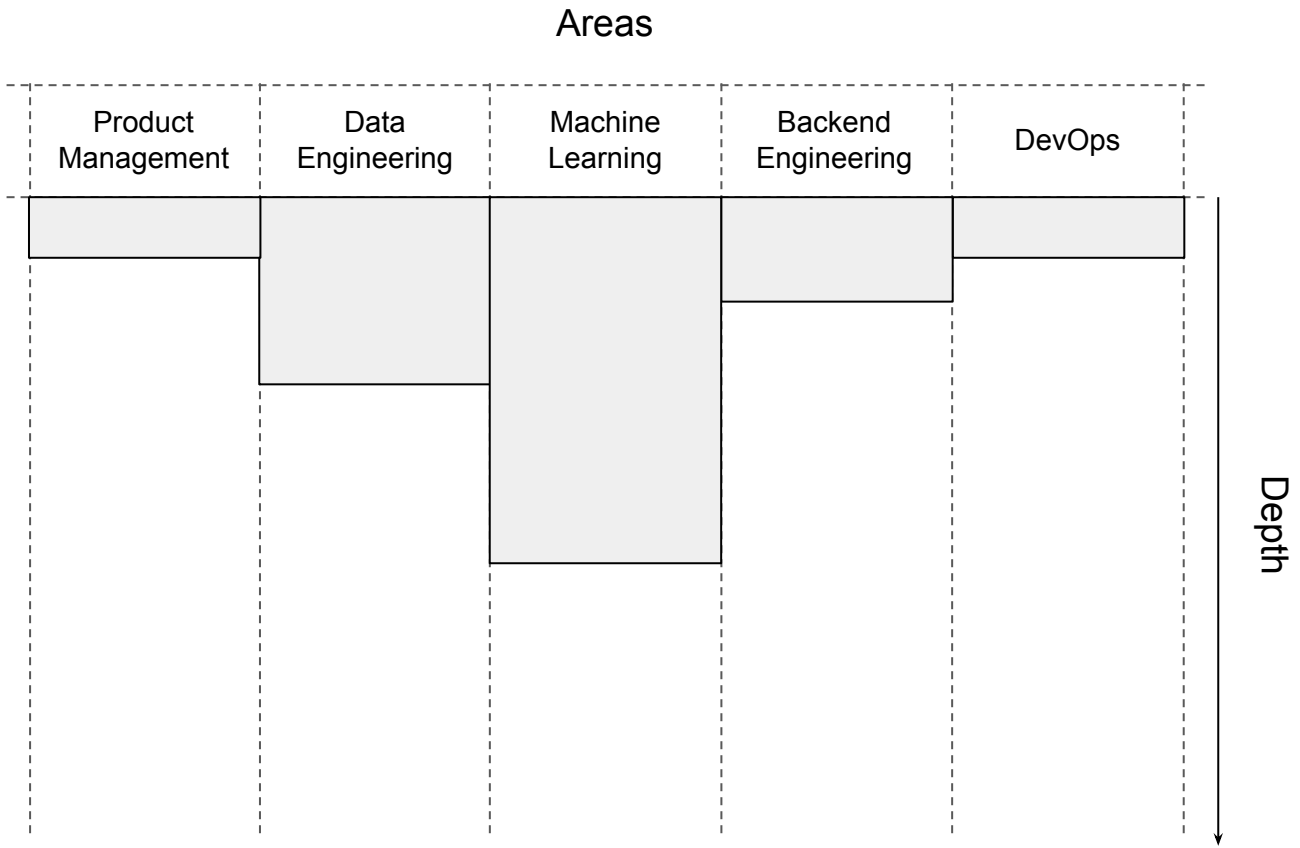
Me now


Areas
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DevOps
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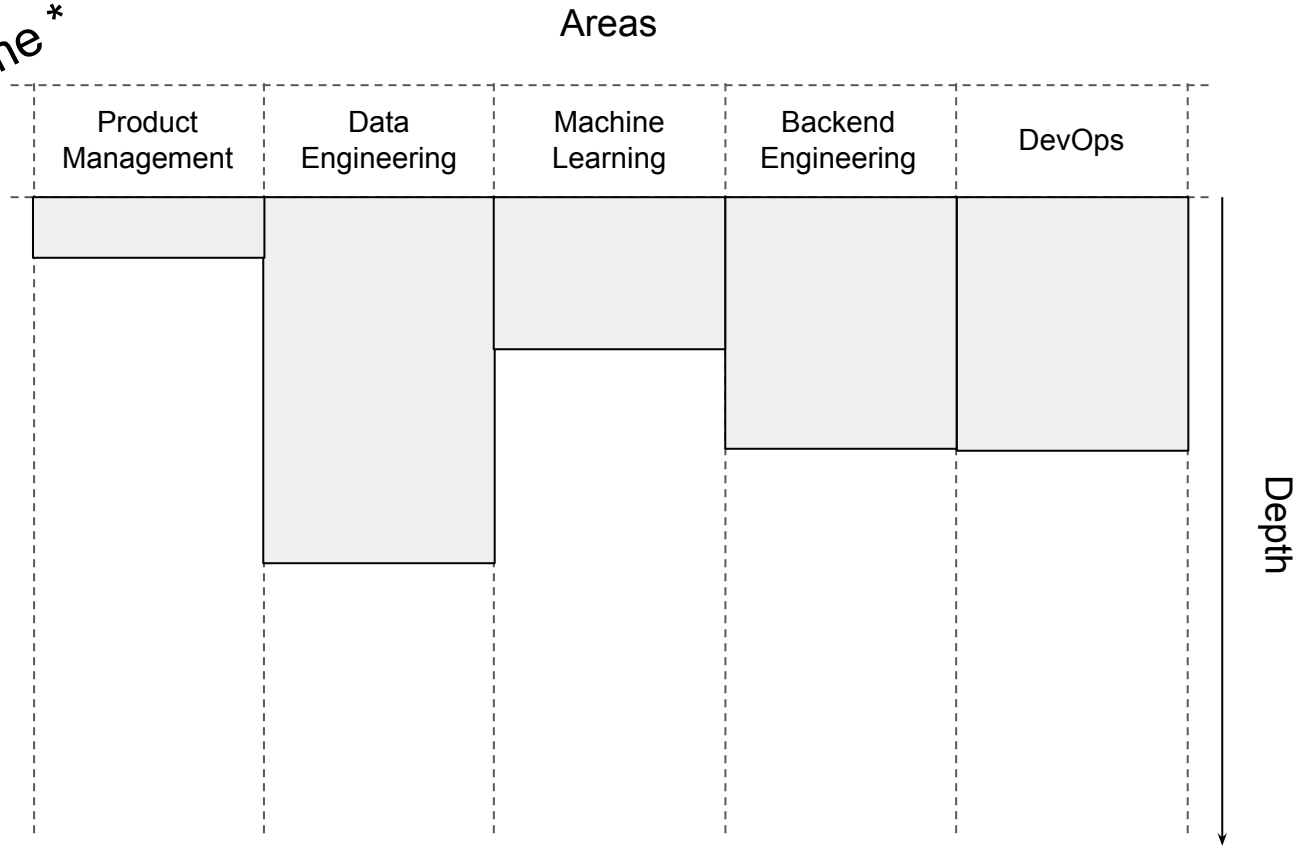
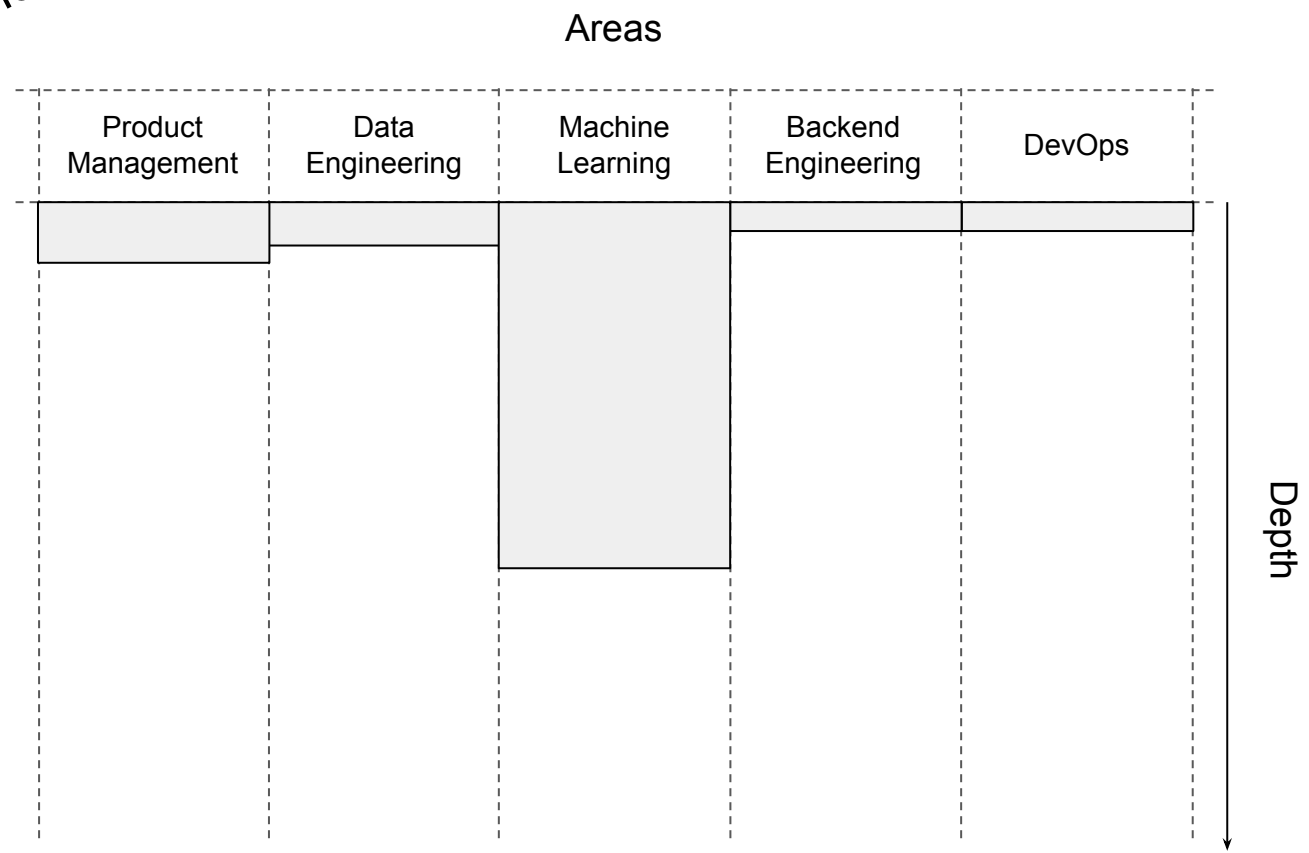
How other DS see me *



* maybe not

How engineers see me *



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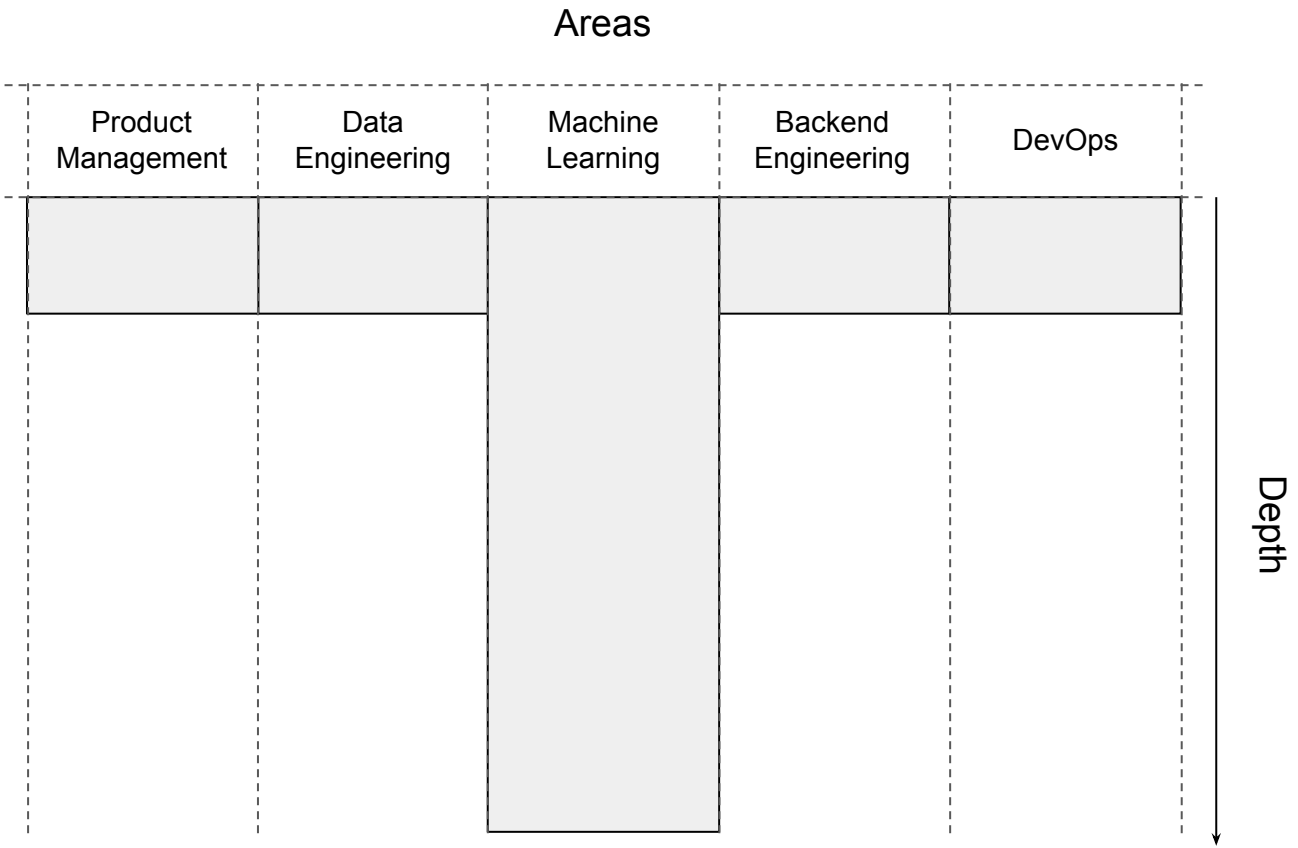
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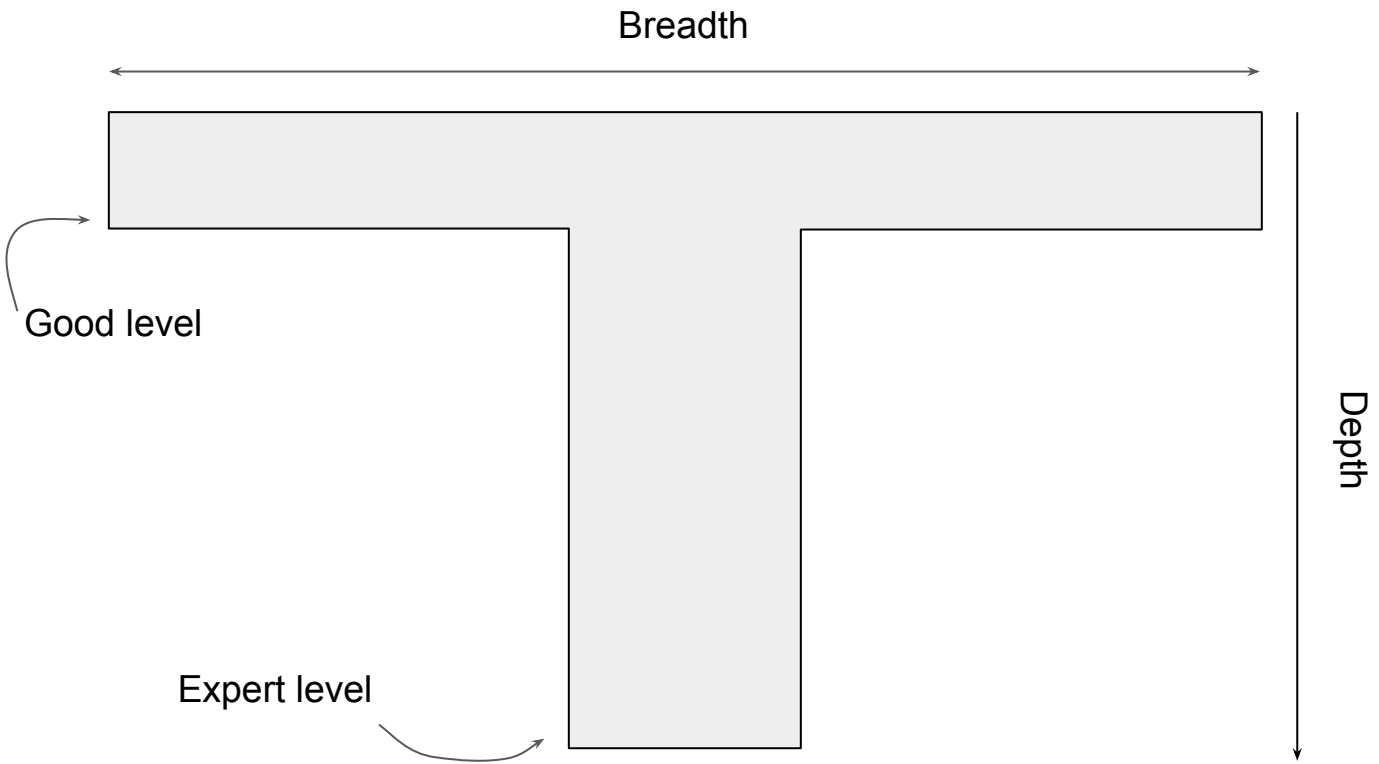
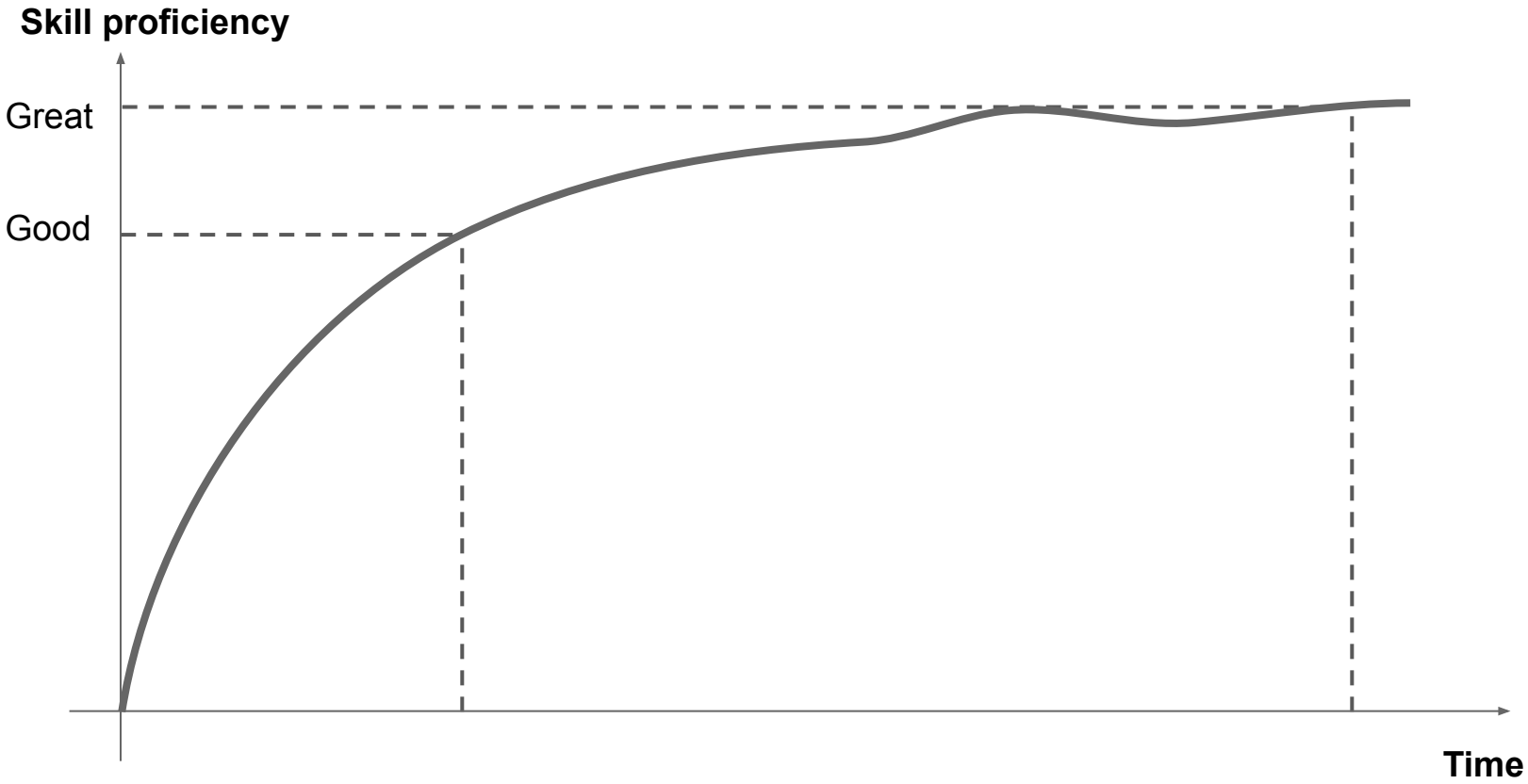

Breadth
Good level
Depth
Expert level


Skill proficiency
Great
Good
Time

80/20 rule

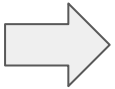
- Break down the role into core areas and skills
- Order the skills by importance
- Pick the most important ones
- Practice practice practice

Product management

- Strategy
- UX & Design
- Communication
- Planning
- Evaluation

Product management

- Strategy
- UX & Design
- Communication
- Planning
- Evaluation



- Requirement gathering
- Prioritization
- Stakeholder management

Data engineering

- SQL Databases
- NoSQL Databases
- Stream processing
- Batch processing
- Data pipelines

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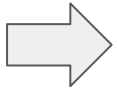

- MySQL
- AWS (S3, Kinesis)
- Spark
- Airflow

Backend engineering

- SQL & NoSQL Databases
- CS fundamentals
- Languages and frameworks
- Web services
- Best practices

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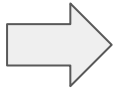
- Best practices



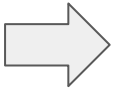
- Python
- Docker
- Tests
- Clean code

DevOps

- Infrastructure
- Automation
- Monitoring
- Reliability

DevOps

- Infrastructure
- Automation
- Monitoring
- Reliability



- AWS
- Kubernetes
- Terraform

Plan

- Data science process (CRISP-DM)
- Roles in the team
- Full-stack data scientist: Jack of all trades
- Becoming full-stack

Summary

- Cover the whole ML project lifecycle
- Invest in software engineering
- It’s not only about technical skills
- Be a T-shaped professional
- Focus on what matters

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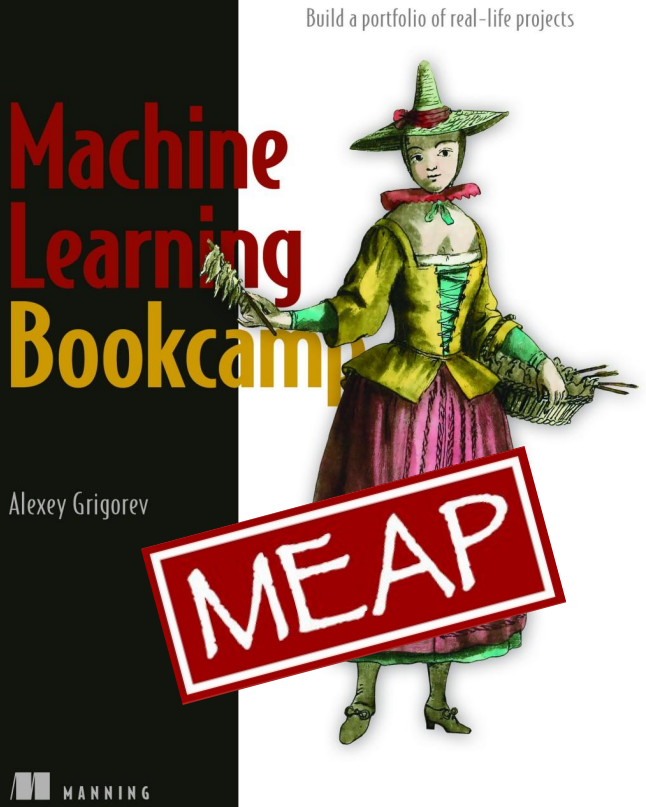

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