

# What Is Next?

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# Overview



Handling features

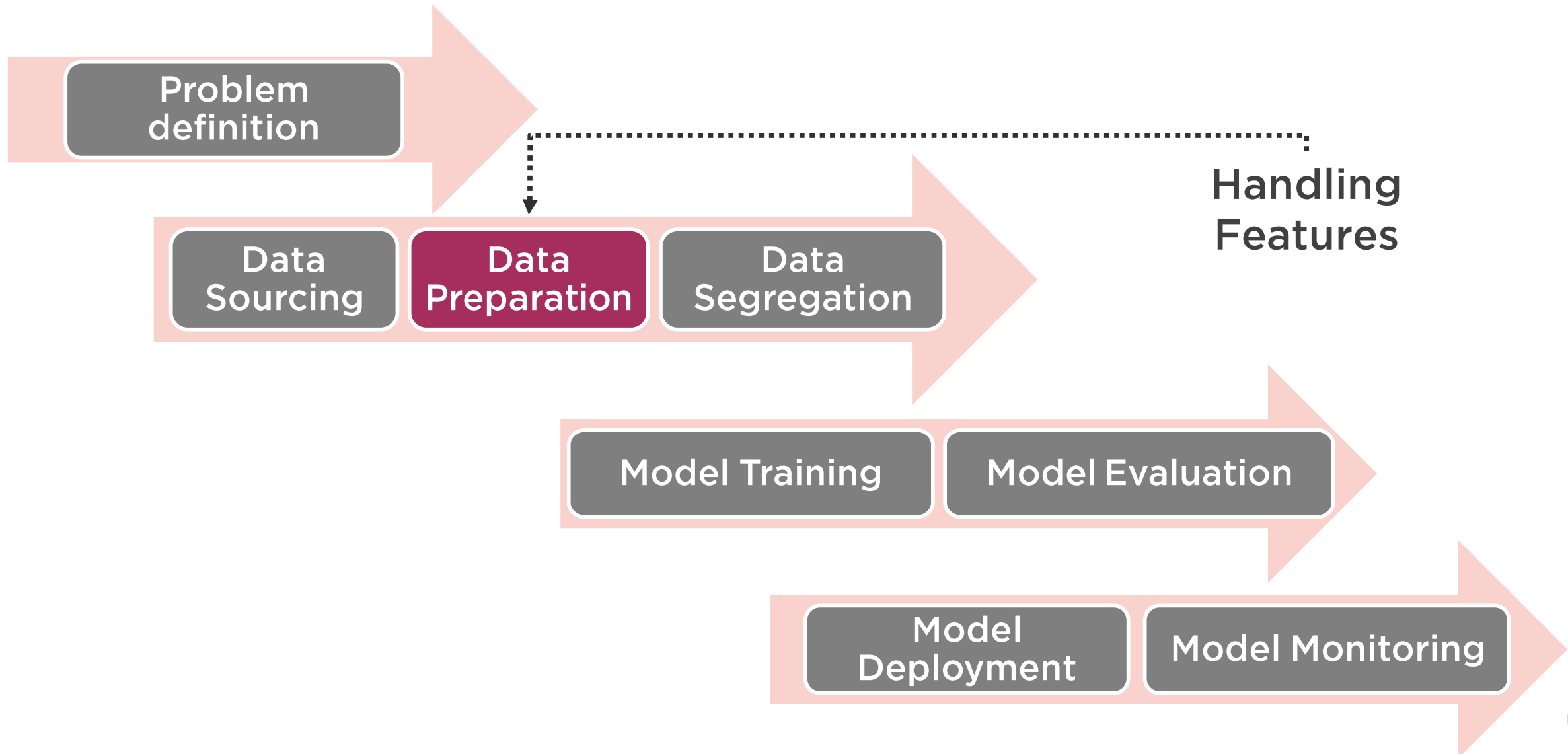
Model improvement

AI as a Service

Machine Learning DevOps



# More on ML: Handling Features



# Handling Features



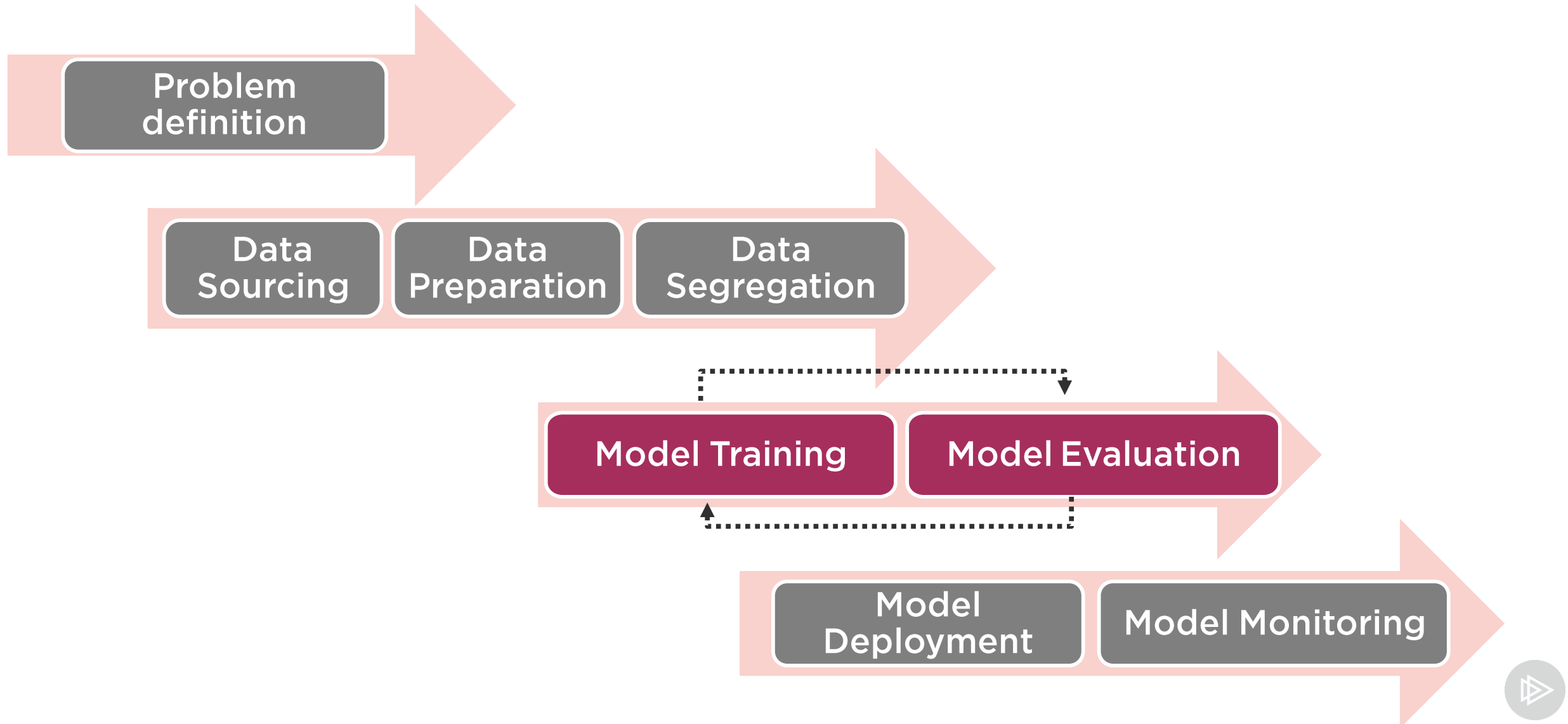
## Why we need to handle features?

### Steps

- Feature engineering
  - Converting birth date to age
  - Converting weekdays to numbers
- Feature scaling
- Feature selection



# More on ML: Model Improvement



# Ensemble Methods



**Combines different ML techniques**

**Common categories**

- Bagging
- Boosting
- Voting

# Hyperparameters Optimization

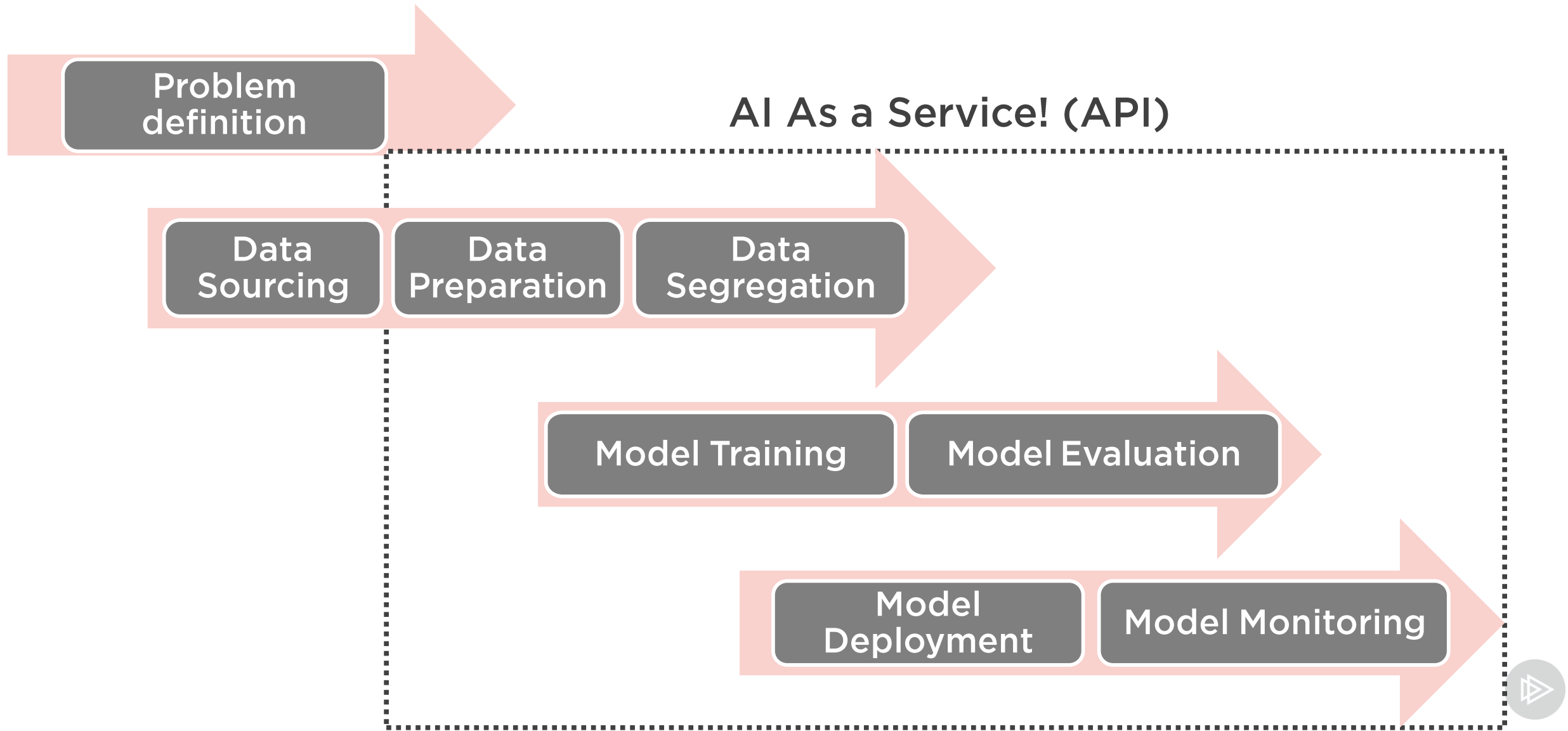


## Blackbox "terminals"

### Types

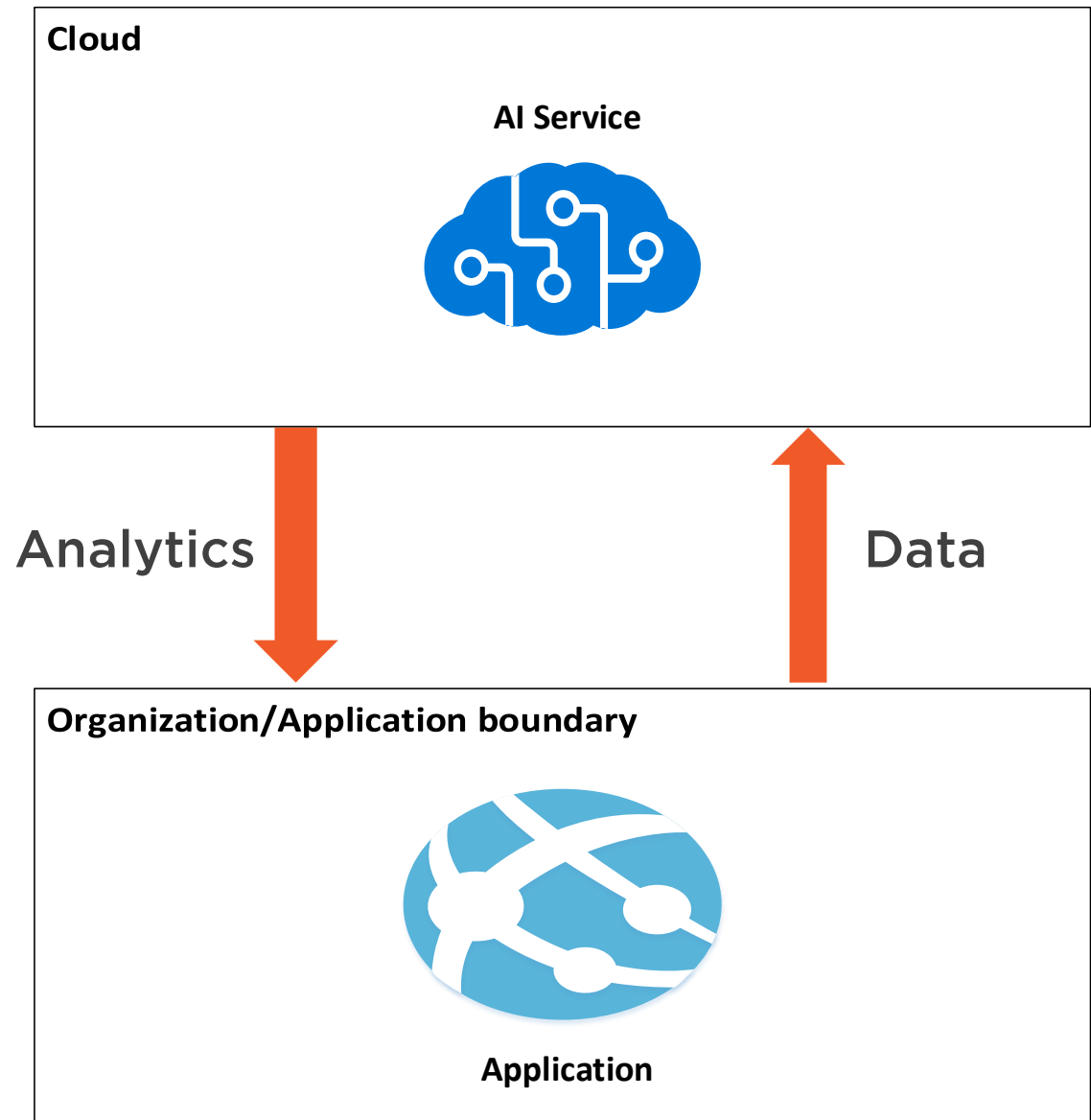
- Grid Search
- Random Search

# More on ML: Automated ML

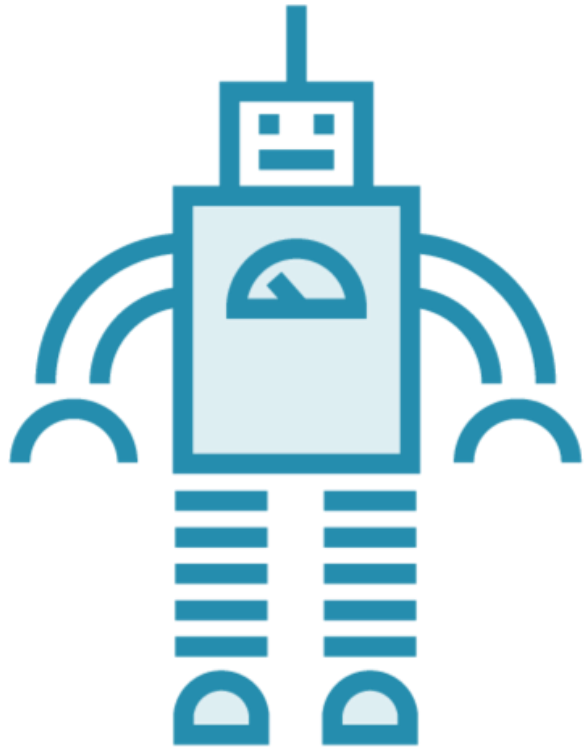




What is that black  
boxed API?



# AI as a Service (AlaaS)



## Abstracted as APIs

### Works well with standardized problems

- Vision
- Text to Speech
- Sentiment Analysis

### Many players in the market

- Microsoft/Amazon/Google

### Challenges

- Performance
- Compliance
- Strict/Lock-In



## Democratized AI – AI as a Service for all!

January 6, 2019 | [8 Comments](#)



### Background ...

Few of years ago, writing a software application that performs any sort of "intelligence" was not the easiest task to do. Considerable know-how around certain frameworks and libraries need to be established, which means learning curve, dollars money, and a risk that many were unwilling to take. I remember 8 years ago, when I was planning to implement some object tracking algorithm for a university project. I had to read around optical flows, Lucas-Kanade (L K) algorithm

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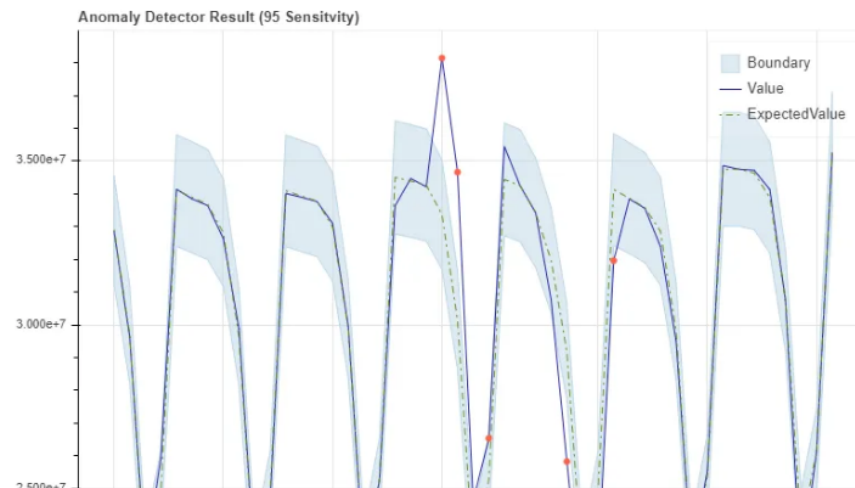
],
"isAnomaly":[
  false,
  false,
  false
],
"isPositiveAnomaly":[
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  false,
  false
],
"isNegativeAnomaly":[
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  false,
  false
],
},
"period":12
}

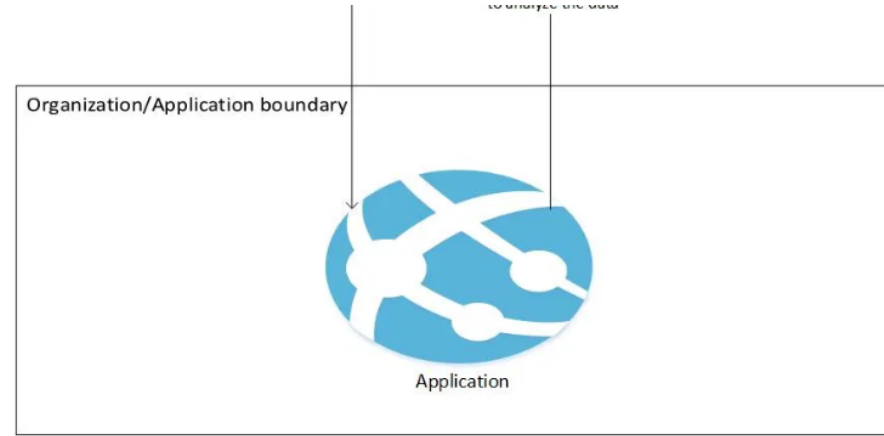
```

Table 3 Batch point detection API response sample – Note that suggested window does not exist

## Explanation through Visualization

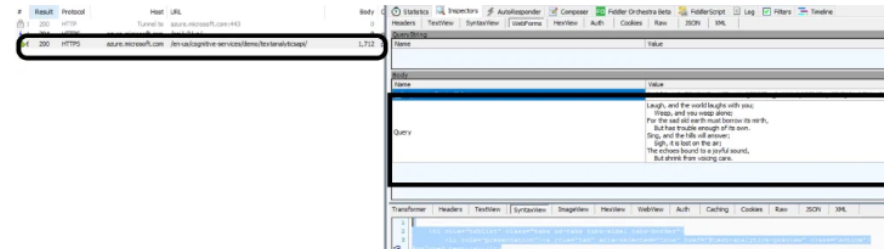
Since *A picture worth a thousand words*, I believe it would be simpler to have an image that explains how anomaly detection works so that we have a deeper understanding of what is actually happening.





Fiddler:

If we intercept the request using fiddler, we can see that the poetry text is transmitted to azure.microsoft.com domain. The elapsed request time was 2.454 seconds.



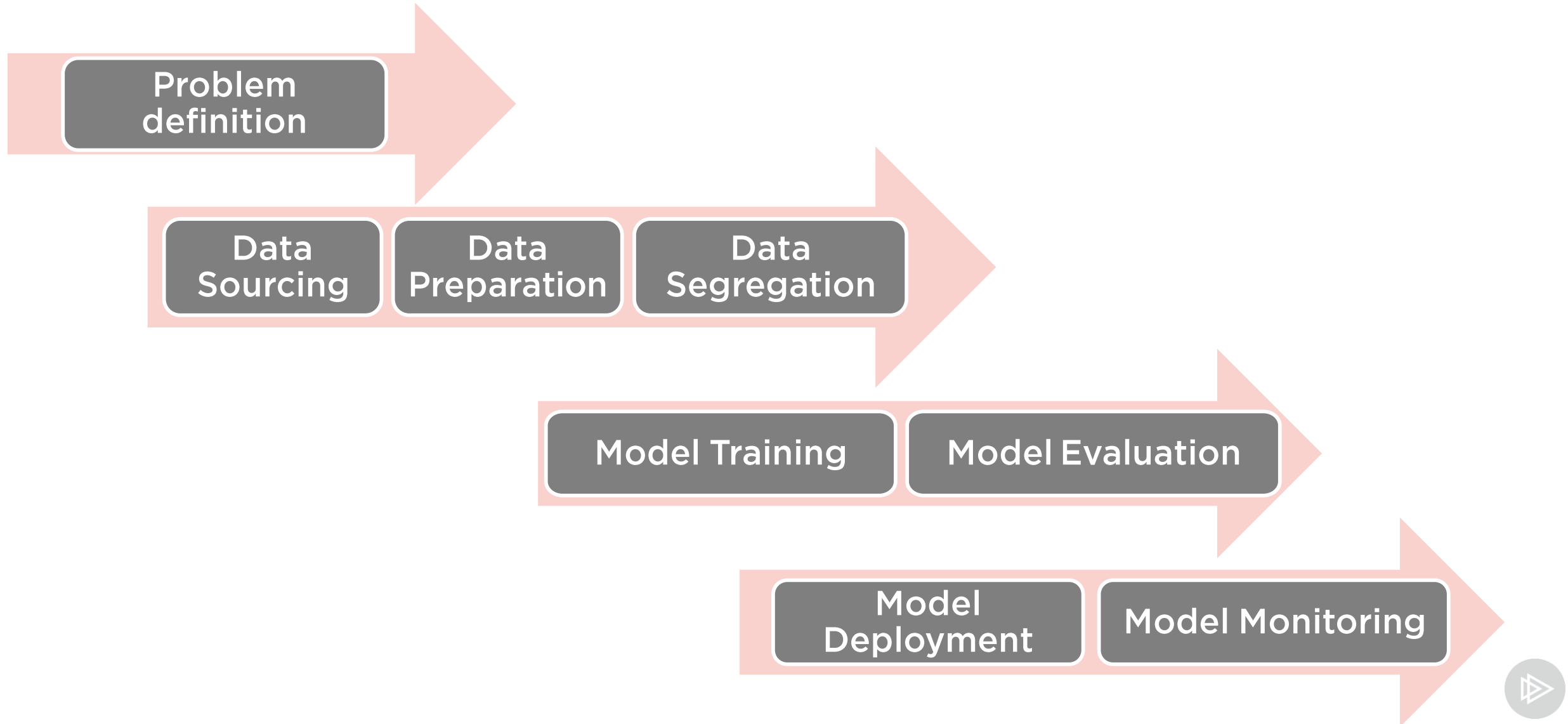
## Case 2: AI service on docker image

The following picture gives a high-level description of how the AI as a Service operation occurs when deployed as Azure cognitive service container:

1. The application sends data to Azure cognitive service container on- prem (confidential data does not leave the organization boundary).
2. Azure cognitive service container responds with analytics results to the application.
3. Azure cognitive service reports back billing information to Azure to debit the subscription (Periodic billing).



# More on ML: Operationalization



# Operationalization



## Deploying our model

- Serialization and Deserialization: Python (Pickle, Joblib)
- Web services (REST)

## Monitoring our model

- Logging
- Auto-healing



# More on ML: Data Science Process

## Team Data Science Process

Problem  
definition

Data  
Sourcing

Data  
Preparation

Data  
Segregation

Model Training

Model Evaluation

Model  
Deployment

Model Monitoring





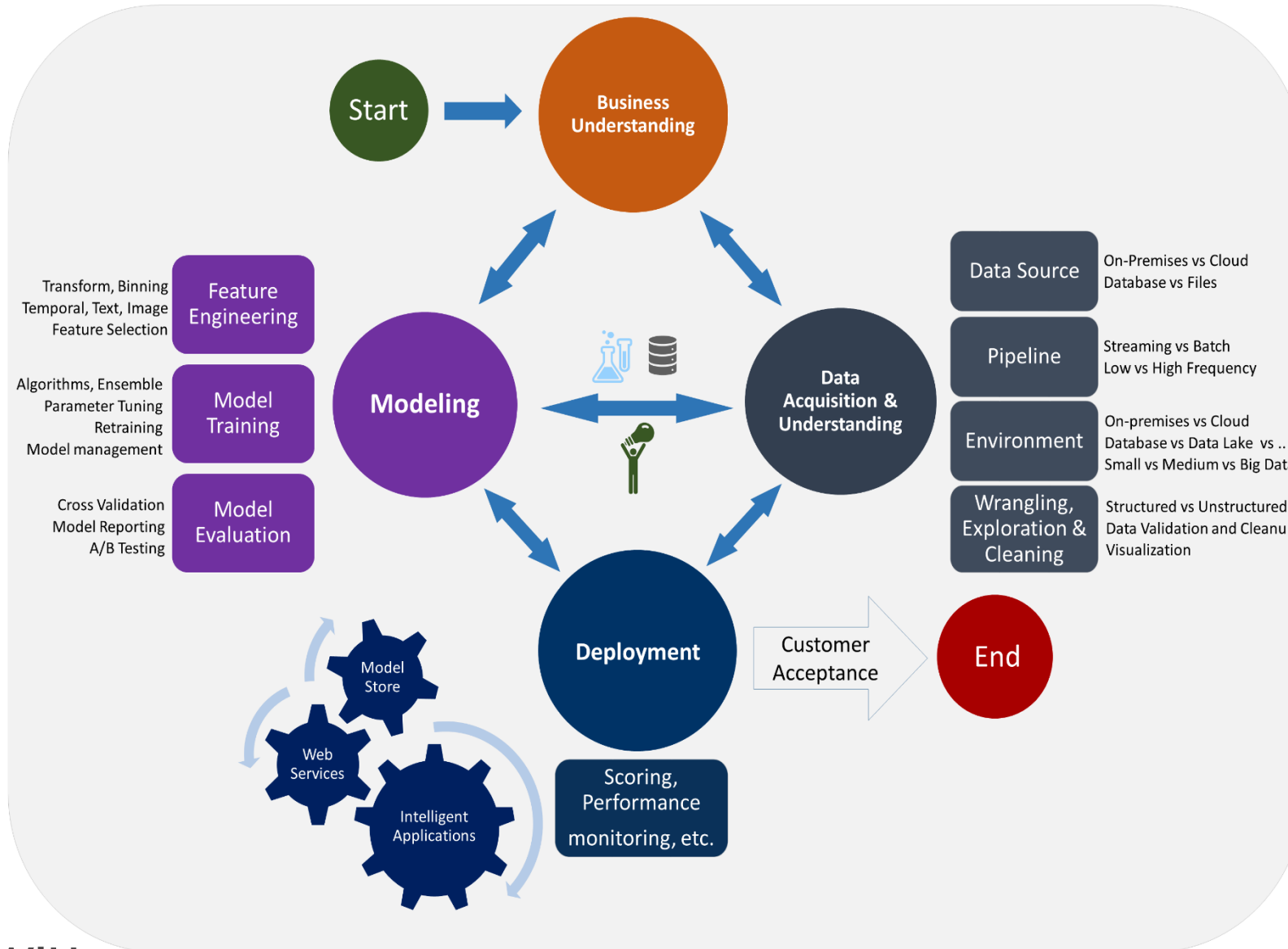
The Team Data Science Process (TDSP) is an agile, iterative data science methodology to deliver predictive analytics solutions and intelligent applications efficiently. TDSP helps improve team collaboration and learning.

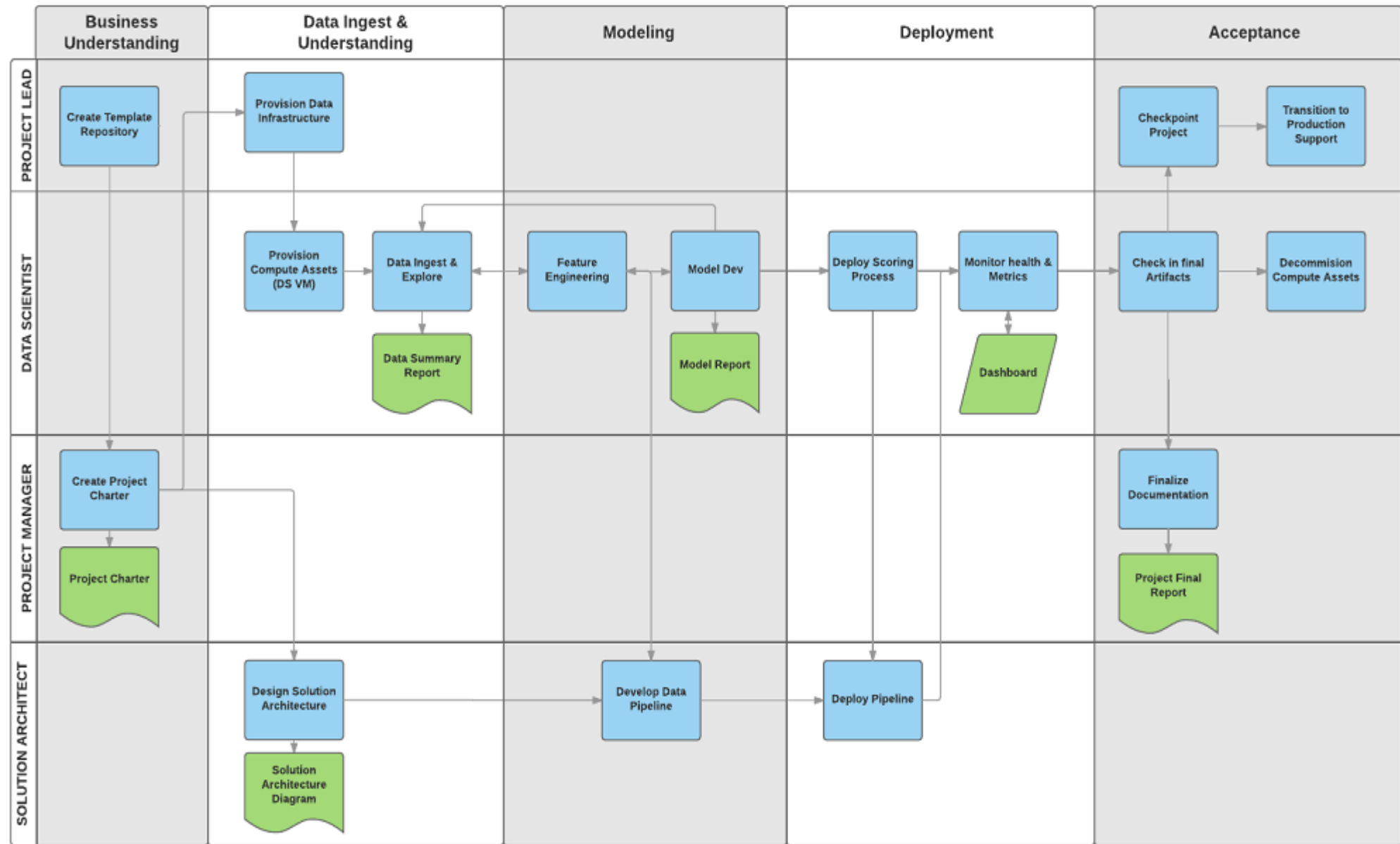
Microsoft:

<http://bit.ly/2R5WiHq>



# Data Science Lifecycle





# Summary



## Handling features

- Feature engineering
- Feature scaling
- Feature selection

## How to make ML model even better

- Ensemble methods
- Hyperparameters optimization

## AI as a Service

- What is it?
- Benefits and challenges

## Machine Learning DevOps

- Operationalization
- Team Data Science Process

