

# How to: MLOps

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Experiment tracking 

& Deployment 





Yke Rusticus



Jeroen Overschie

# Today we will:

- Learn how we see **MLOps in practice**
- Get hands-on with a *notebook* ML solution
- Step by step work towards a **production-ready application**

## We will **not**:

- Cover machine learning itself in depth

All material is available on: [xebia.ai/mlops](https://xebia.ai/mlops)

# Schedule

- Introduction
- MLOps: what the fuzz?
- Experiment tracking
- Demo 
- Hands-on 
  - Train model
  - Track experiments
  - Register model
- 
- Model serving
- Containerizing
- Deployment
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  - Run API
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# MLOps: what the fuzz?

DevOps

SecOps

MLOps ?

...Ops hype

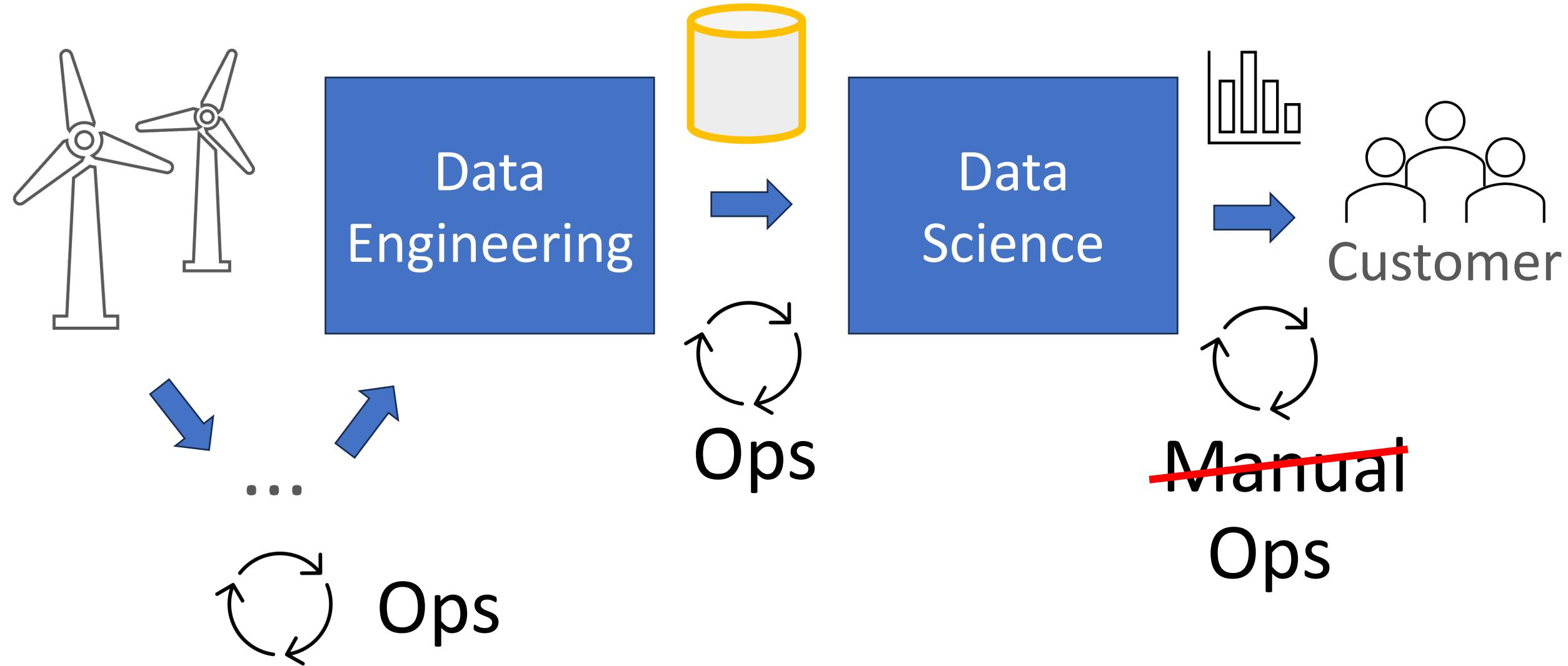
DevSecOps

LegOps

DataOps

LLMOps

# Why MLOps?



# Why MLOps?



Daisy Data Scientist @ TurbineDynamics

Task: help business improve generated power forecast.



Ideate with  
business to define  
use case & value



Explore data to  
find possible  
relationships



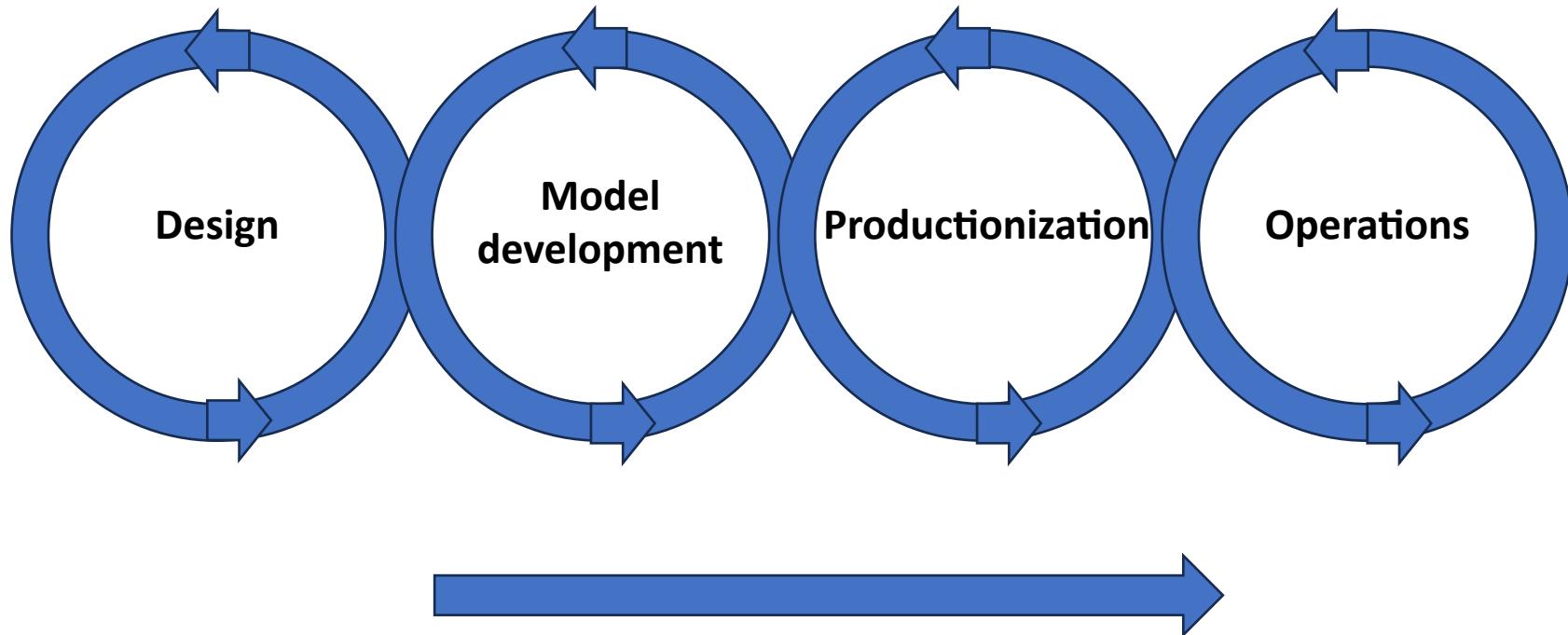
Create predictive  
model in a  
notebook



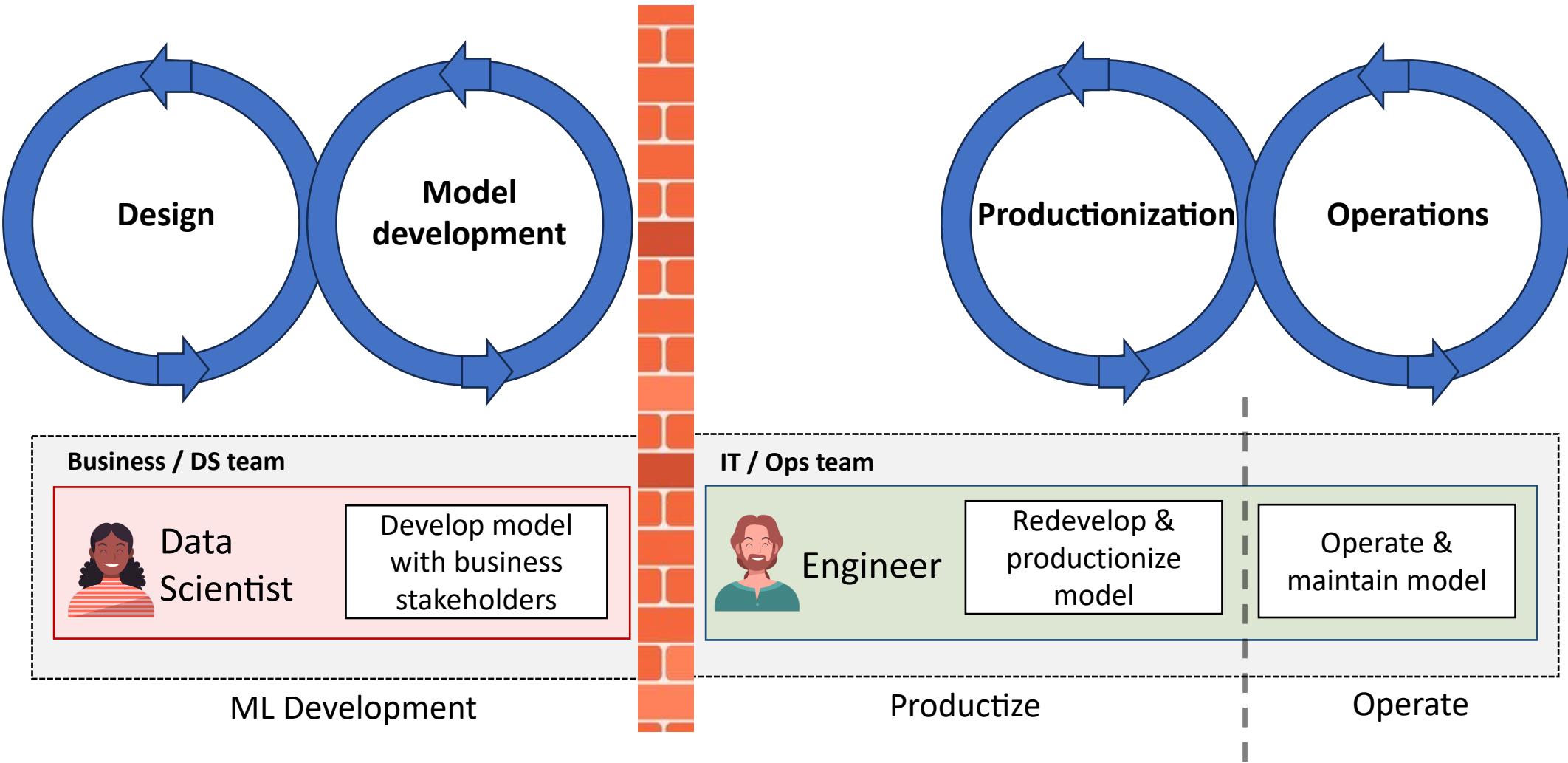
Now what?



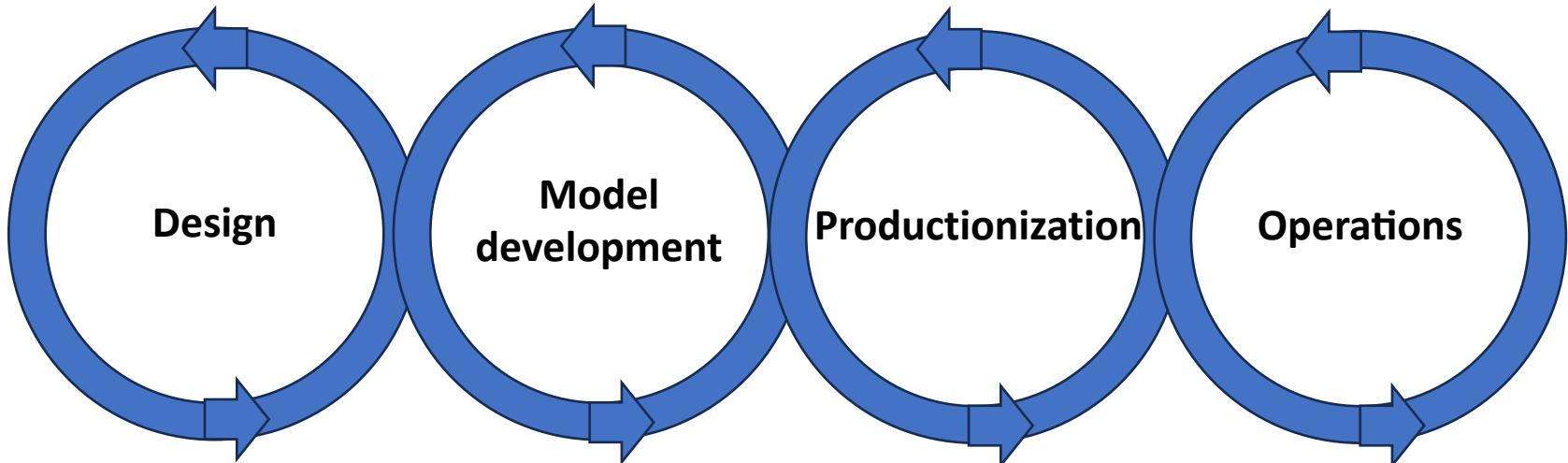
# Ideally: “MLOps lifecycle”



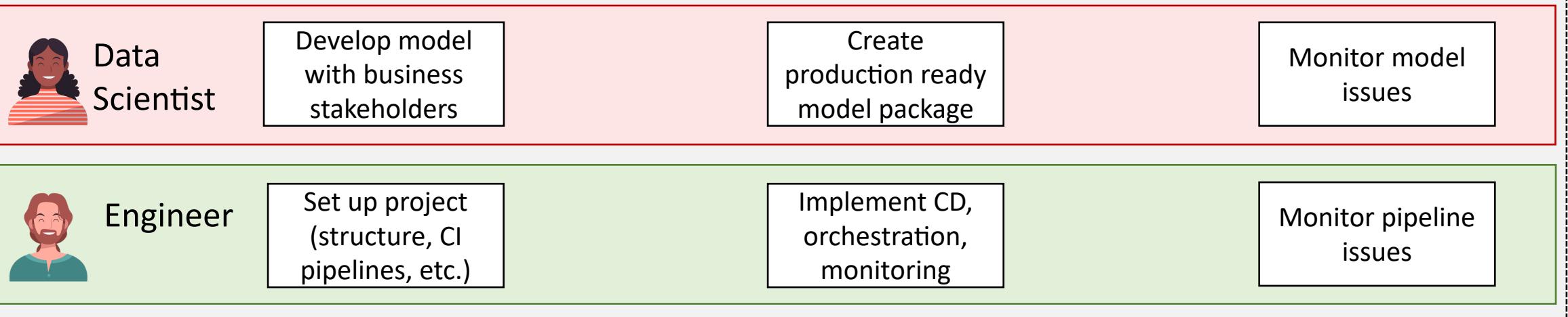
# However, we often see a *handover*



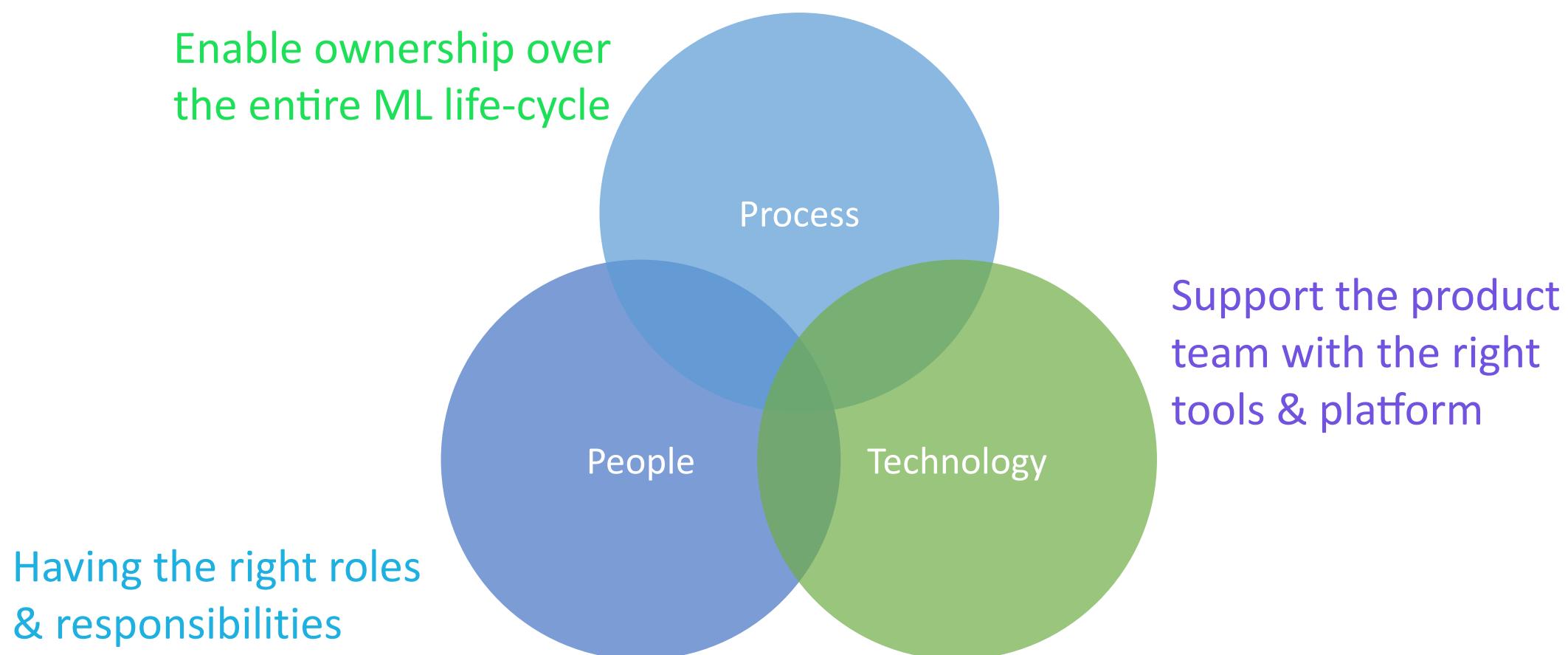
# MLOps: close the gap



End-to-end DS product team



# MLOps: close the gap by combining the right people, processes and technology



# Experiment tracking with **MLflow**

mlflow™

DOCS



An open source platform for the  
machine learning lifecycle

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WORKS WITH ANY ML  
LIBRARY, LANGUAGE &  
EXISTING CODE

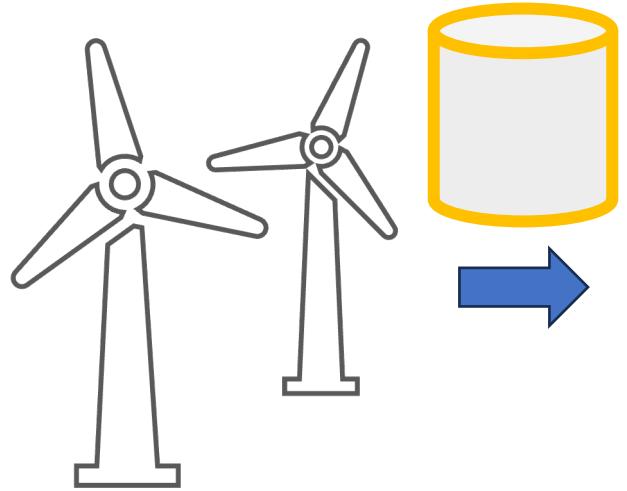


RUNS THE SAME WAY IN ANY  
CLOUD

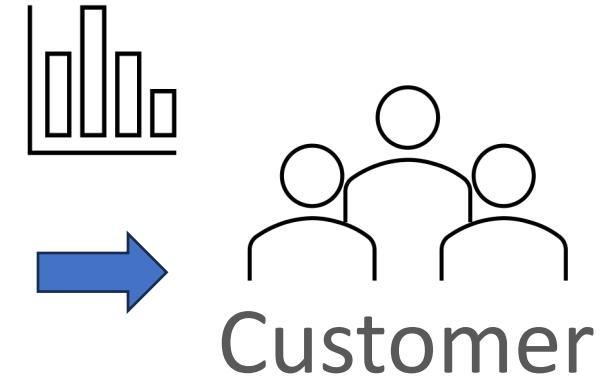


DESIGNED TO SCALE FROM  
1 USER TO LARGE ORGS

Why  
Experiment  
tracking?

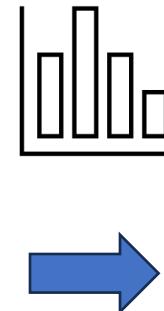
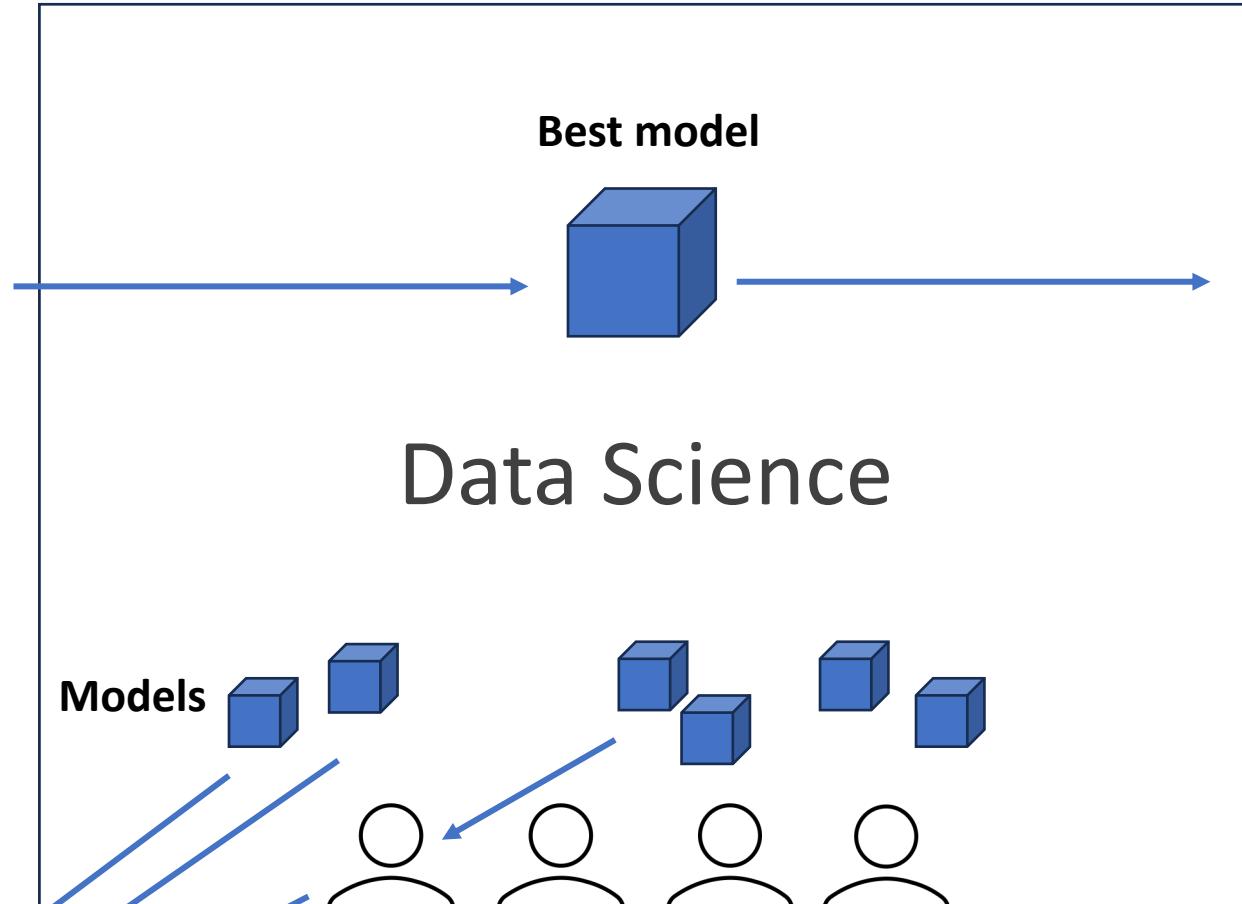
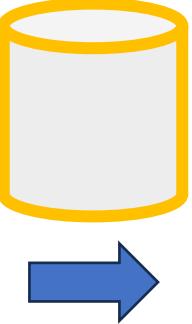
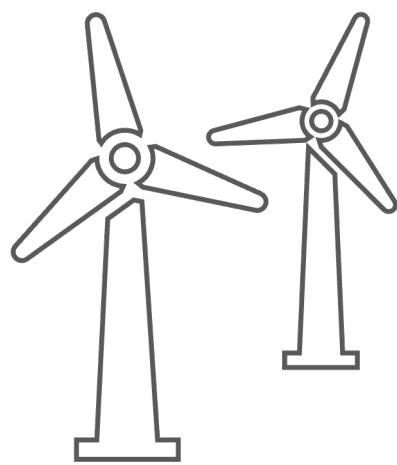


Data Science

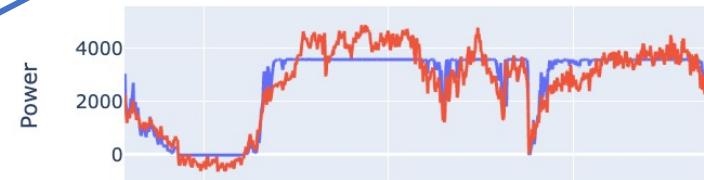


Customer

# Why Experiment tracking?



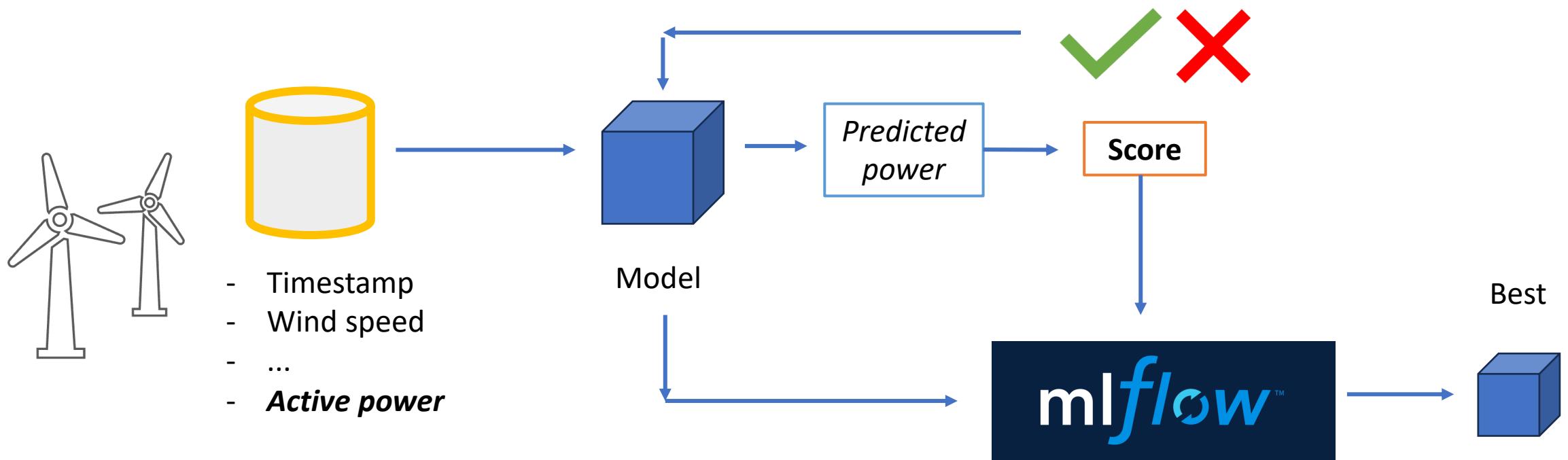
Customer



**Best model:**  
R2 score = 0.9

# Demo 🧑: setup & experiment tracking

# Demo 🧑: setup & experiment tracking



# Hands-on 🧑💻: setup & experiment tracking

1. Navigate to [xebia.ai/mlops](https://xebia.ai/mlops)
2. Follow the setup instructions in the **README**
3. Do exercises:
  - 01-explore-data.ipynb
  - 02-train-model.ipynb
  - 03-track-experiments.ipynb
  - 04-load-model-for-inference.ipynb

# Schedule

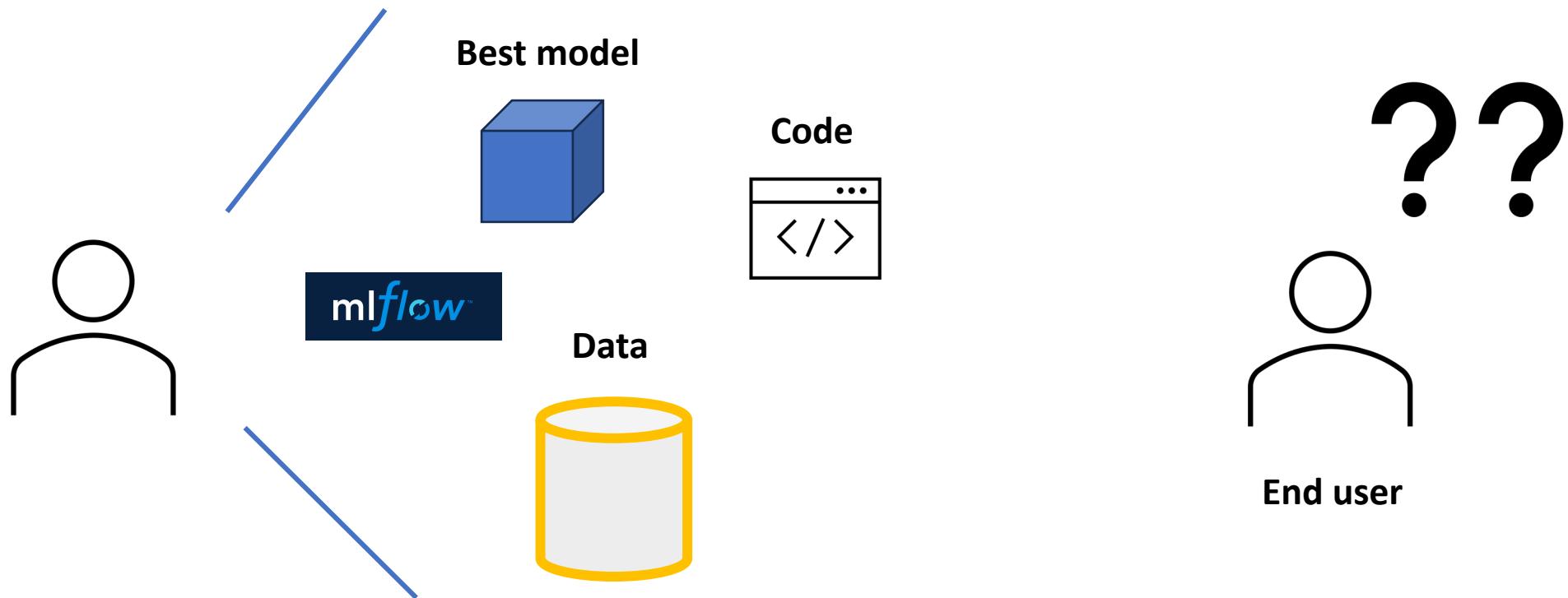
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# Serving the model

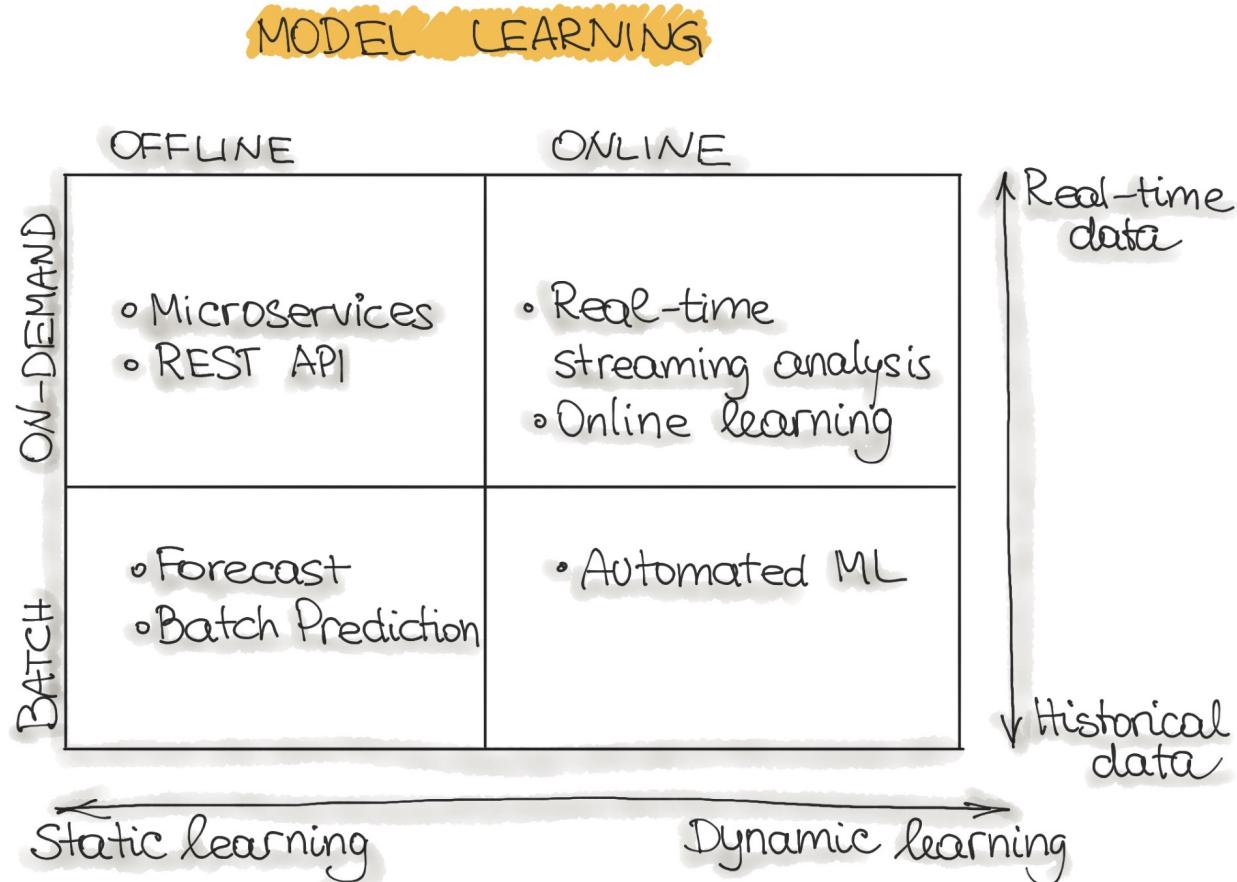


# We cannot expect others to run our model...

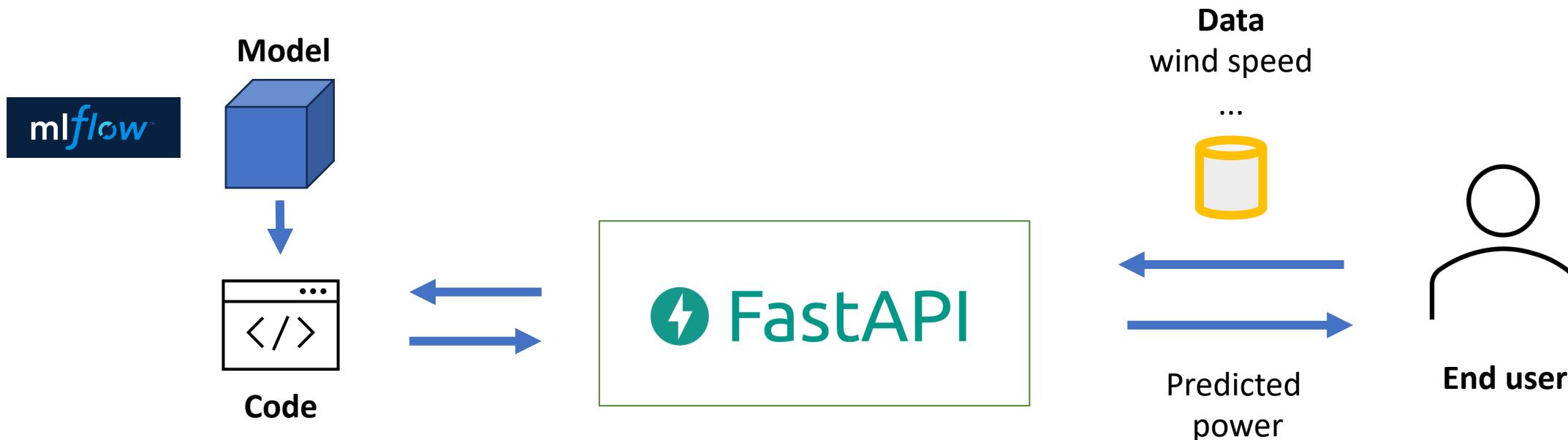


## MODEL SERVING PATTERNS

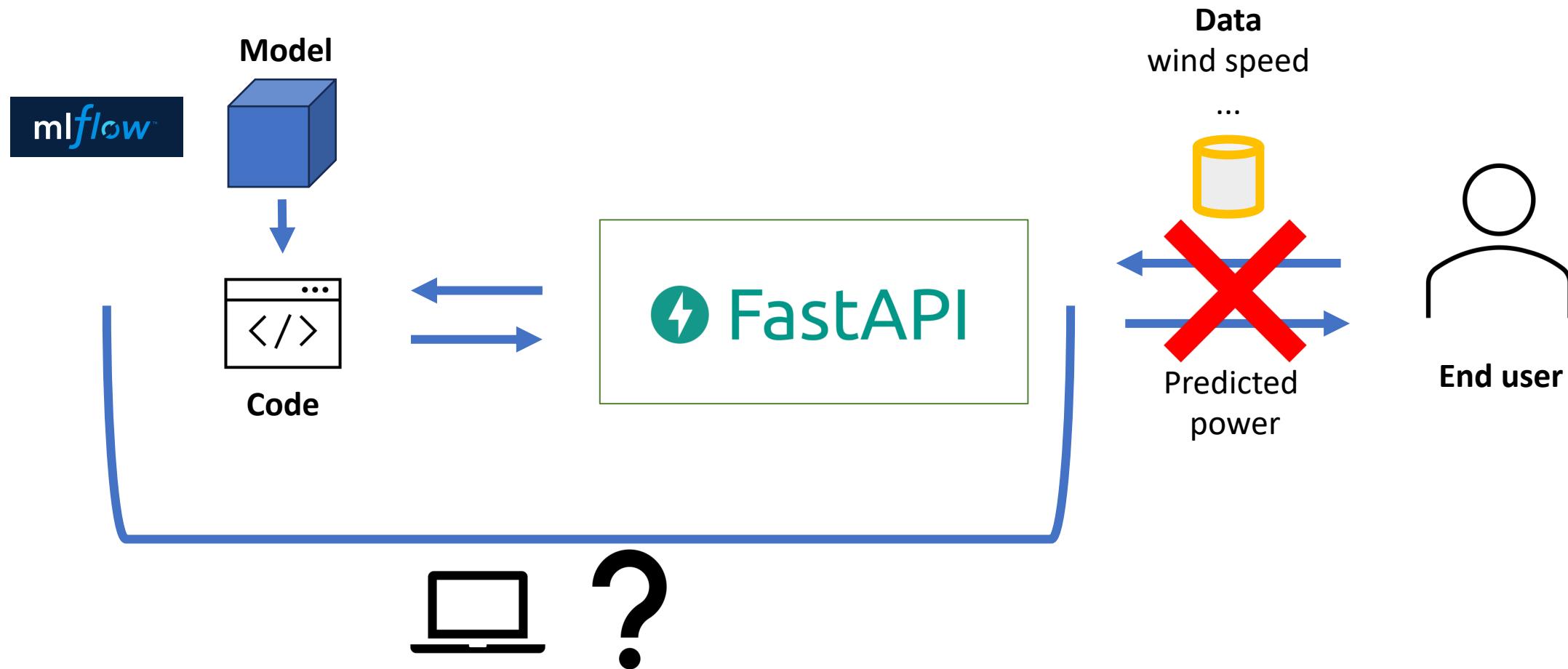
### MODEL PREDICTION



# An API allows user to use our model without worrying about the logic behind

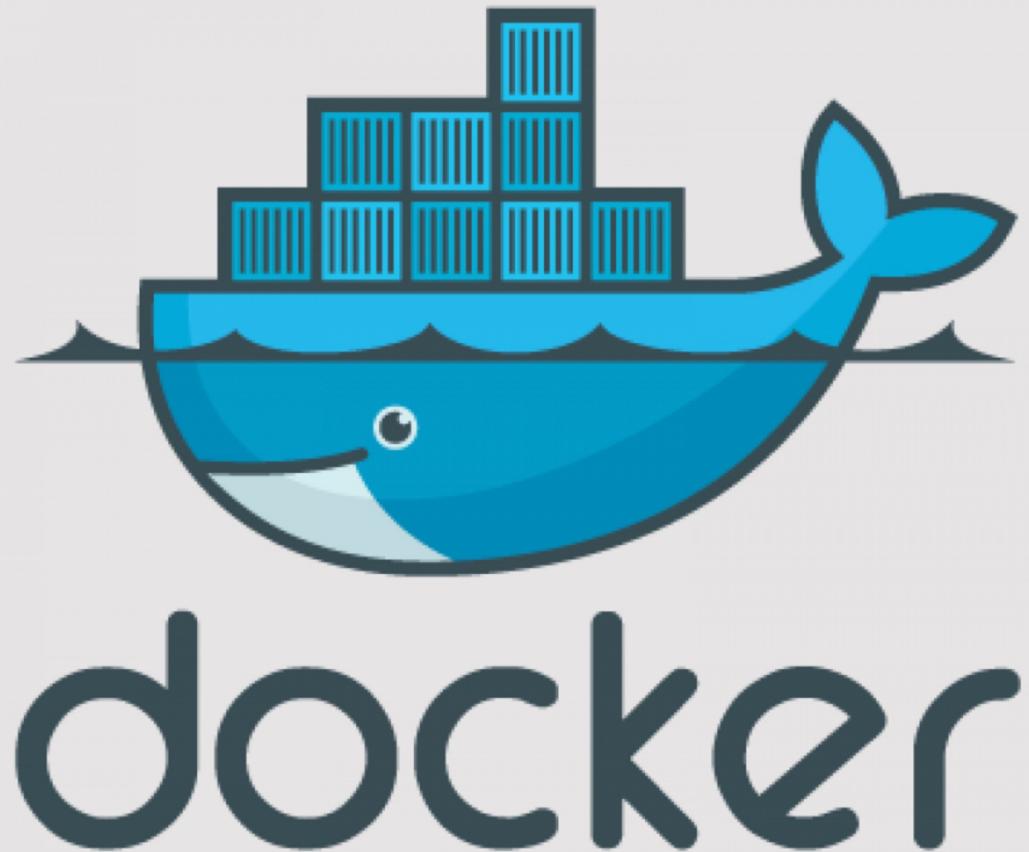


# Where to run our API?

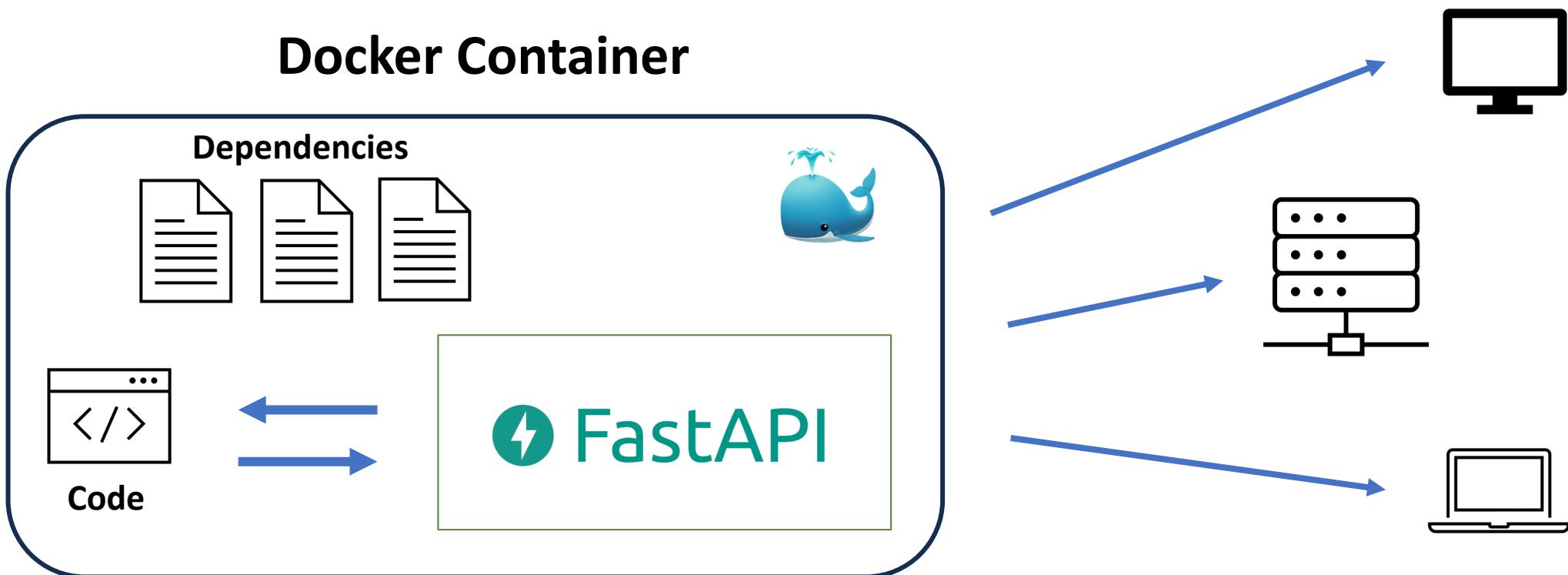


# Containerizing our application

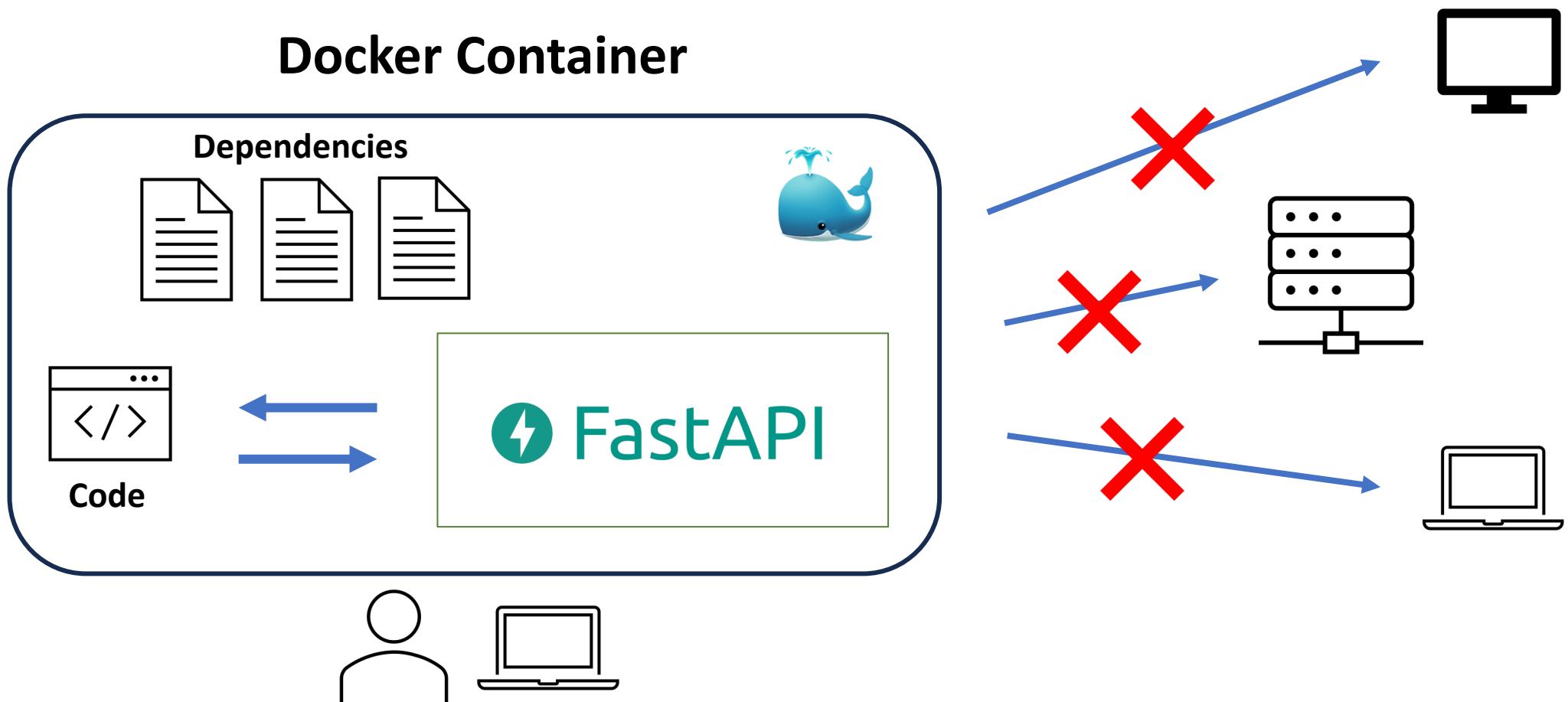
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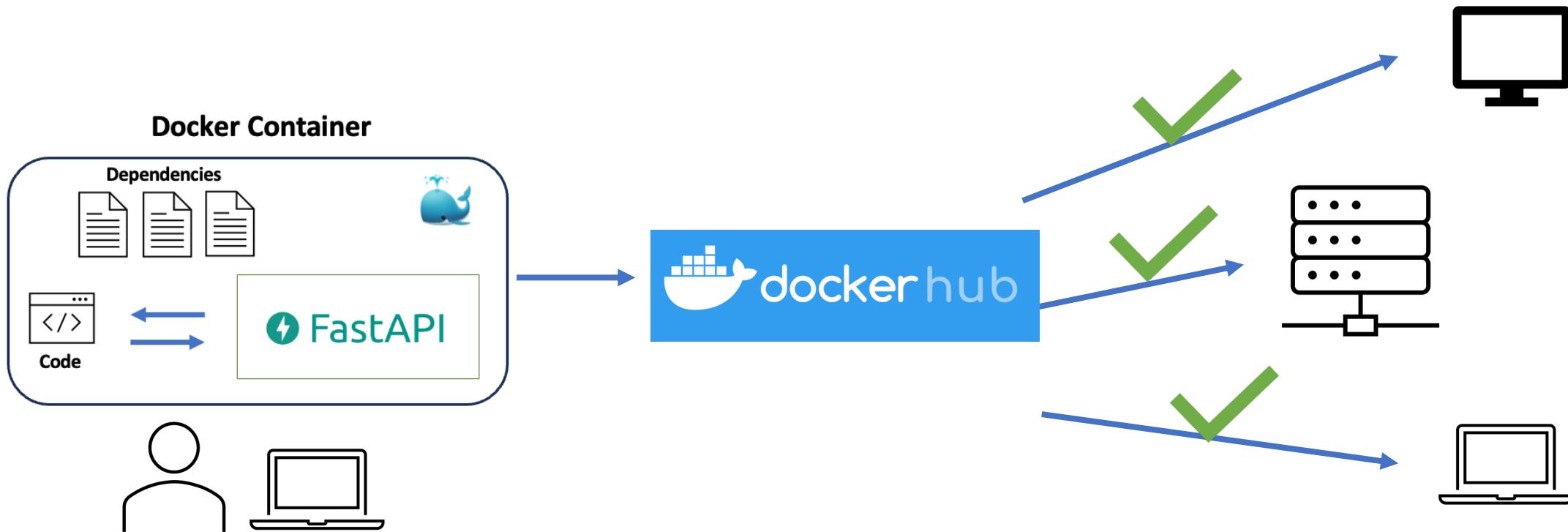
# Container allows us to run it anywhere!



# But, how do we get it there?



# Register it on Docker Hub!

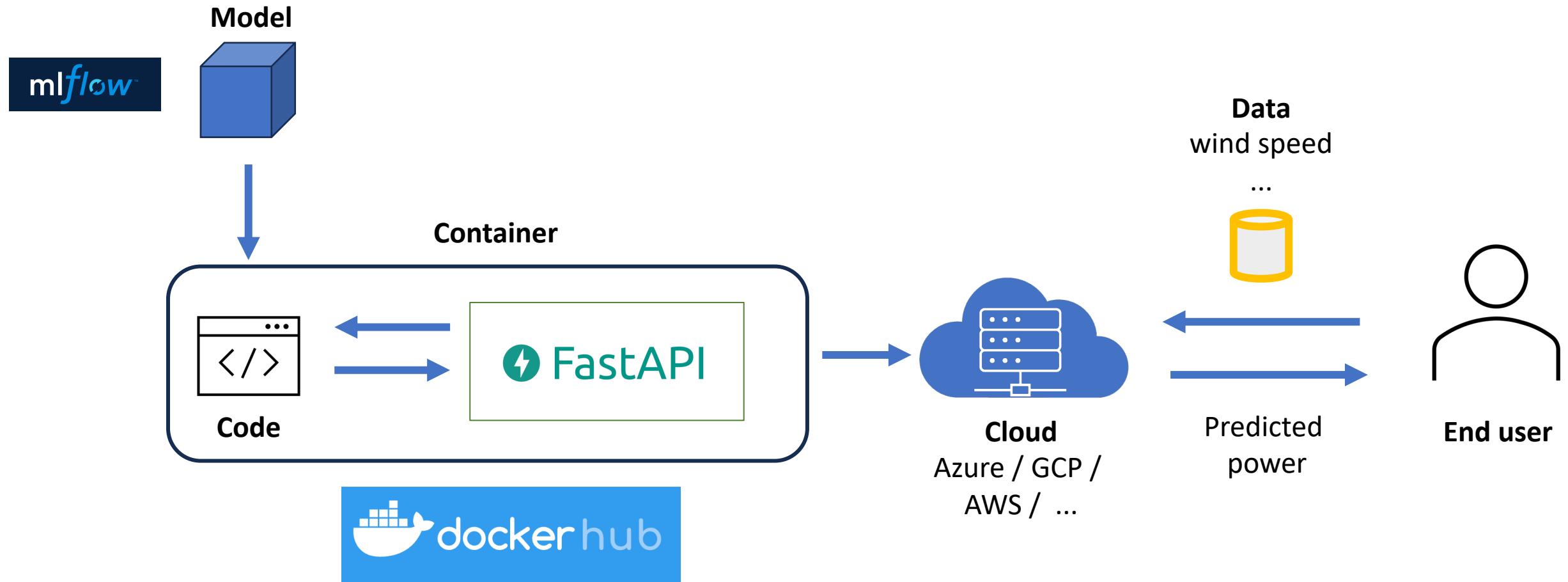




# Deployment to the cloud



# Running our container in the cloud allows users to access it

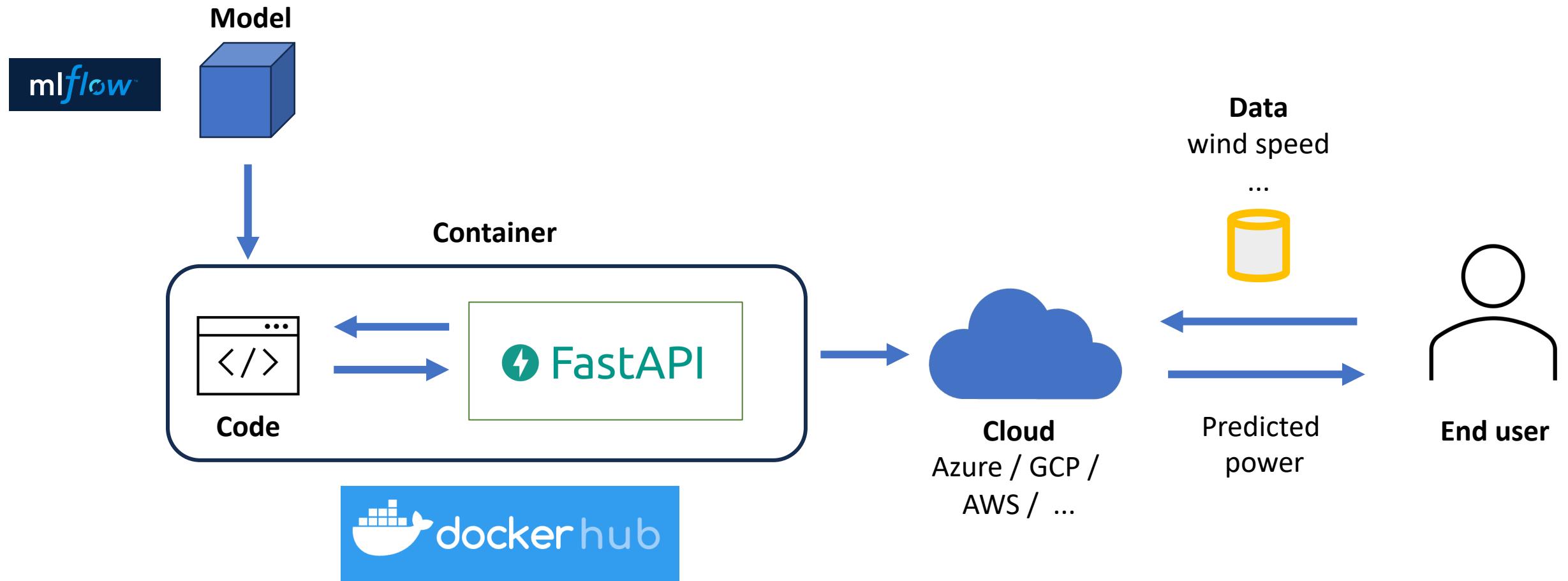


# Demo 🧑: model serving & deployment

# Hands-on 🧑💻: model serving & deployment

- Continue with the remaining exercises:
  - 05-create-and-run-api.md
  - 06-containerize-application.md
  - 07-register-on-dockerhub.md
  - 08-deploy-to-the-cloud.md
  - 09-(bonus)-automate-with-cicd.md

# Started from notebook, ended with ML application



**Thank you!**