





How to: MLOps

Experiment tracking 
& Deployment 

xebia.ai/mlops





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Goals

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

Schedule

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

MLOps: what the fuzz?

DevOps

SecOps

MLOps ?

...Ops hype

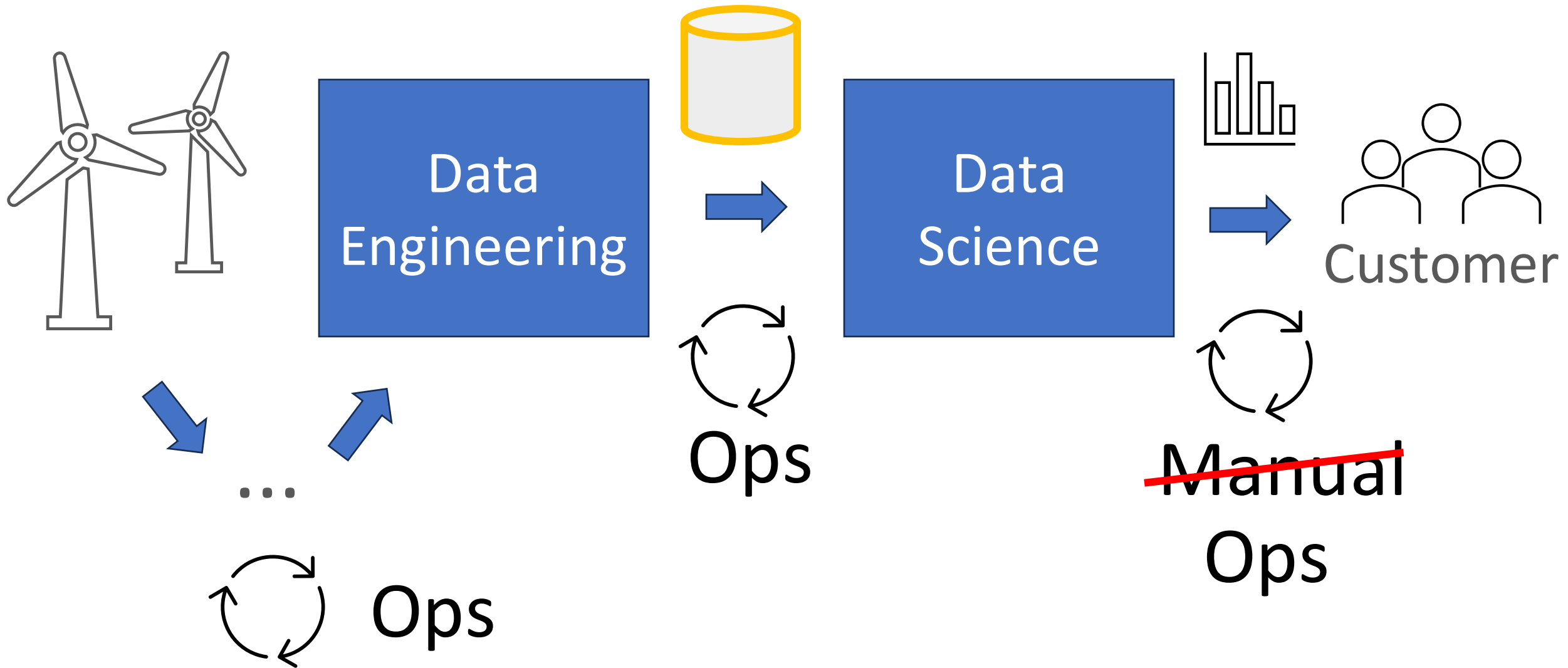
DevSecOps

LegOps

DataOps

LLMOps

Why MLOps?



Why MLOps?



Daisy Data Scientist @ TurbineDynamics

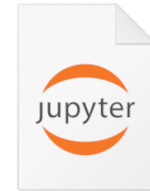
Task: help business improve generated power forecast.



Ideate with
business to define
use case & value



Explore data to
find possible
relationships



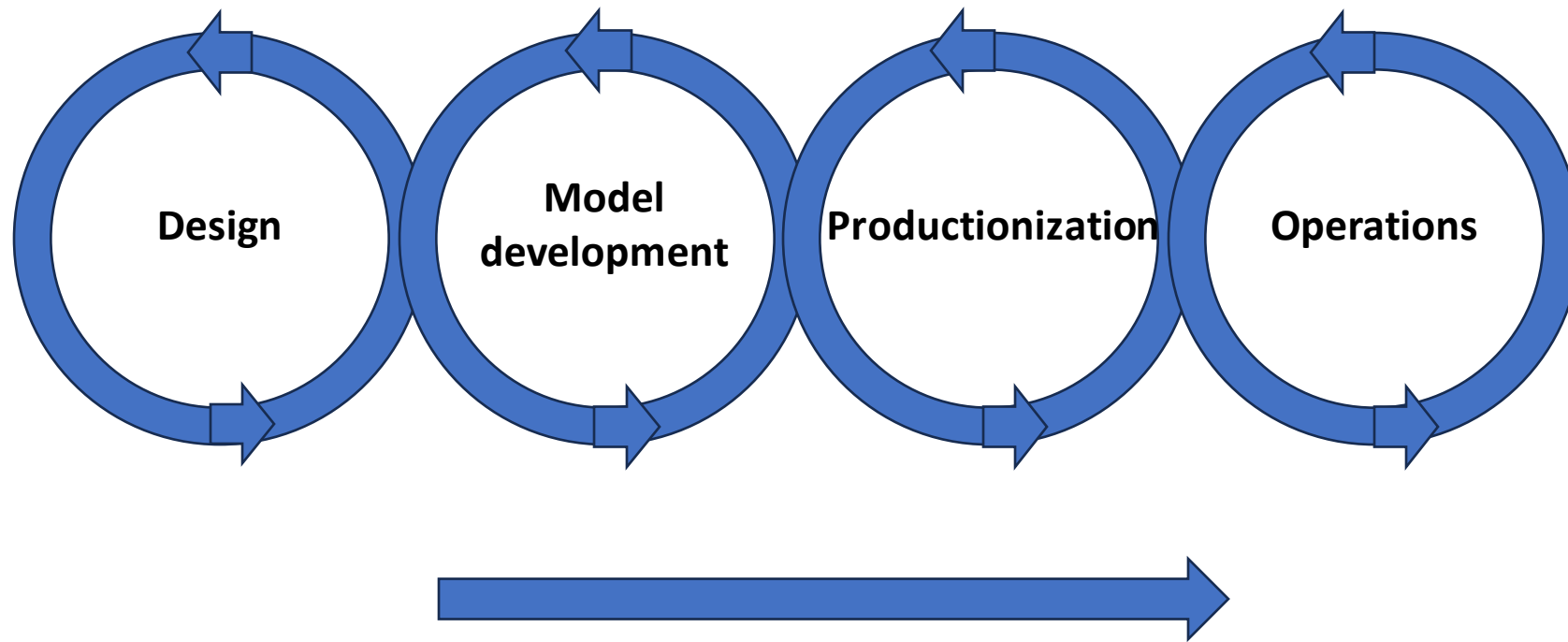
Create predictive
model in a
notebook



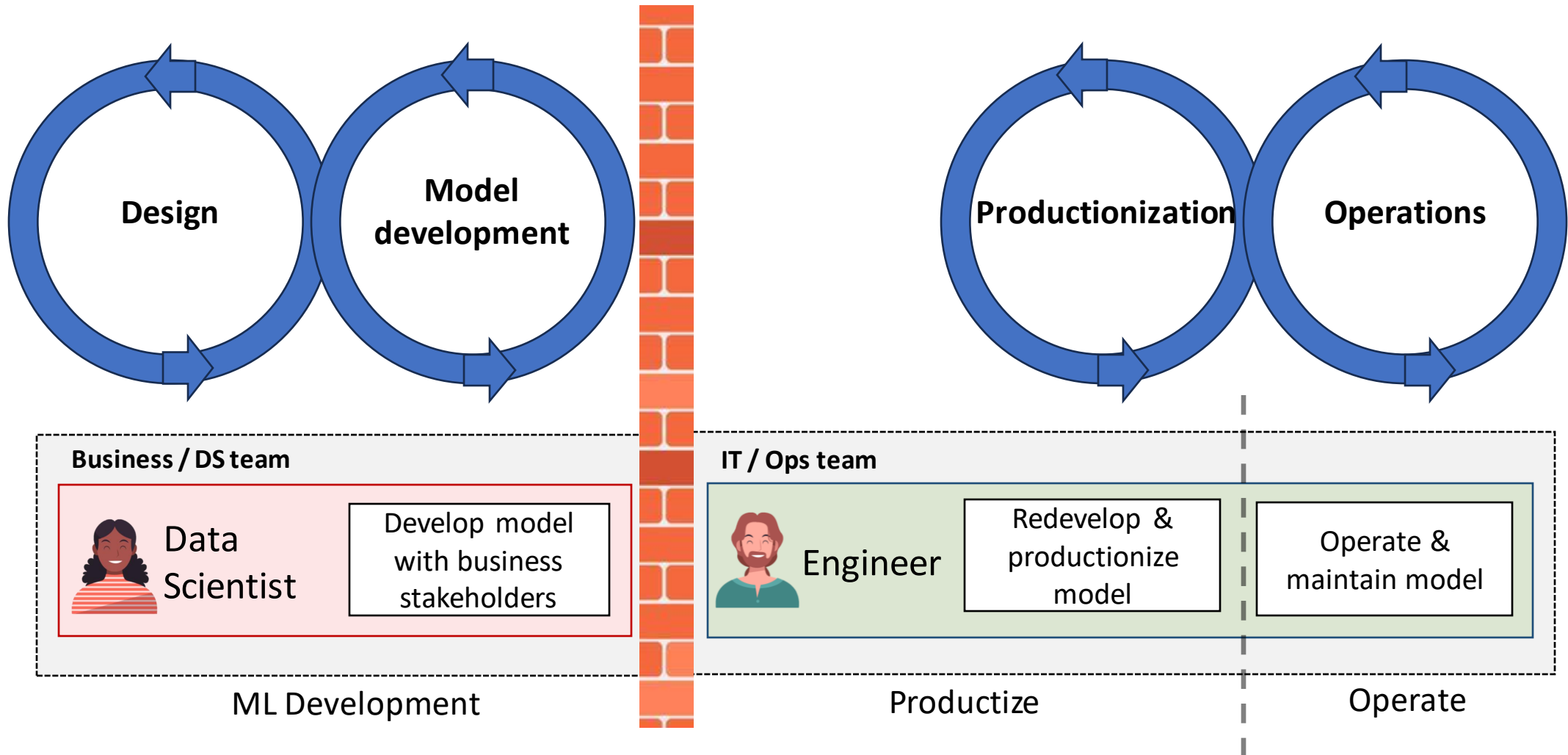
Now what?



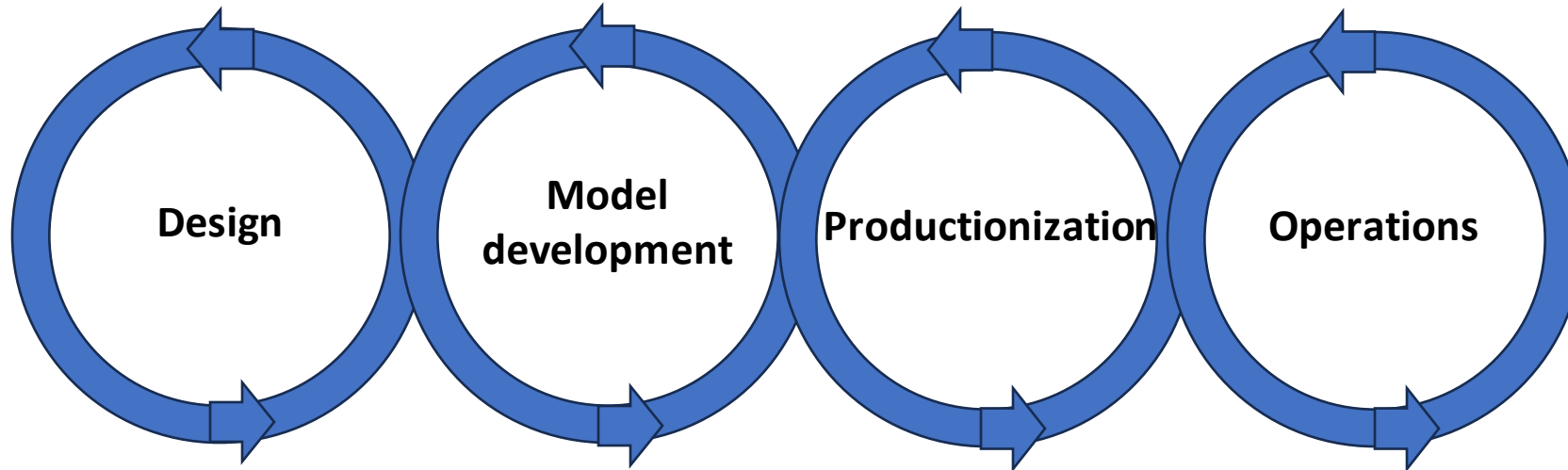
Ideally: “MLOps lifecycle”



However, we often see a *handover*



MLOps: close the gap



End-to-end DS product team



**Data
Scientist**

Develop model
with business
stakeholders

Create
production ready
model package

Monitor model
issues



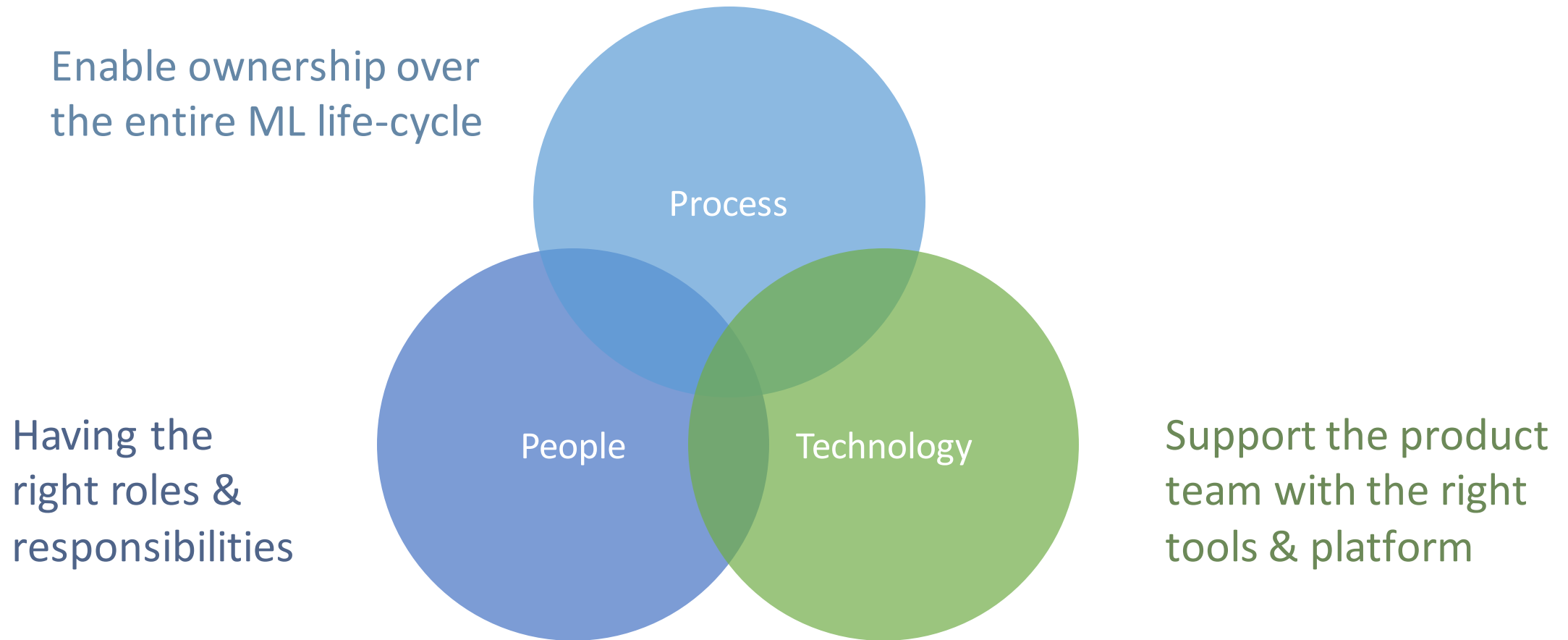
Engineer

Set up project
(structure, CI
pipelines, etc.)

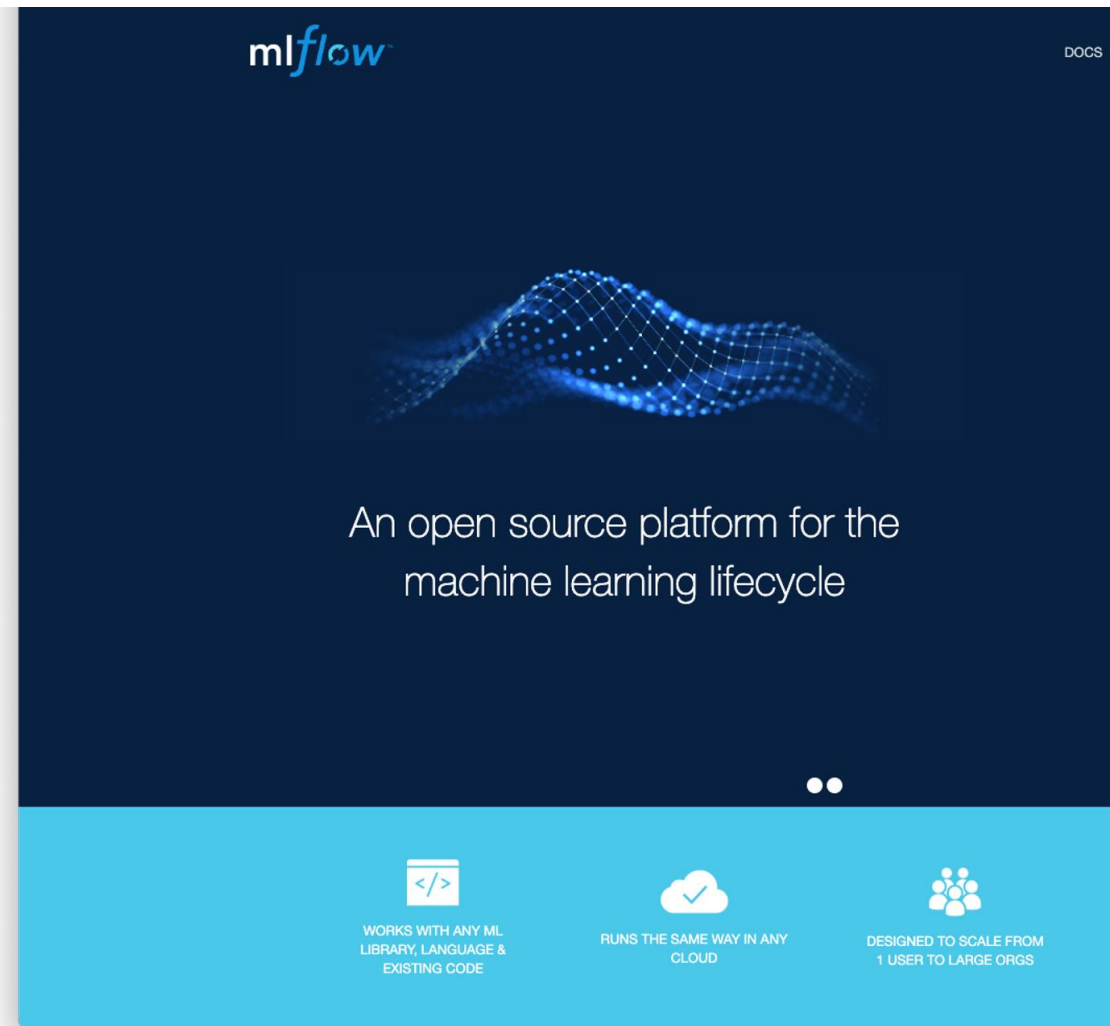
Implement CD,
orchestration,
monitoring

Monitor pipeline
issues

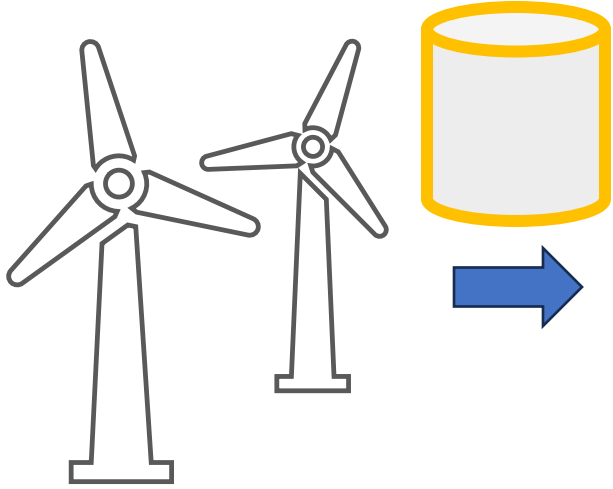
MLOps: close the gap by combining the right **people**, **processes** and **technology**



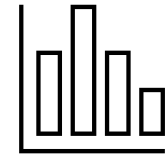
Experiment tracking with MLflow



Why
Experiment
tracking?

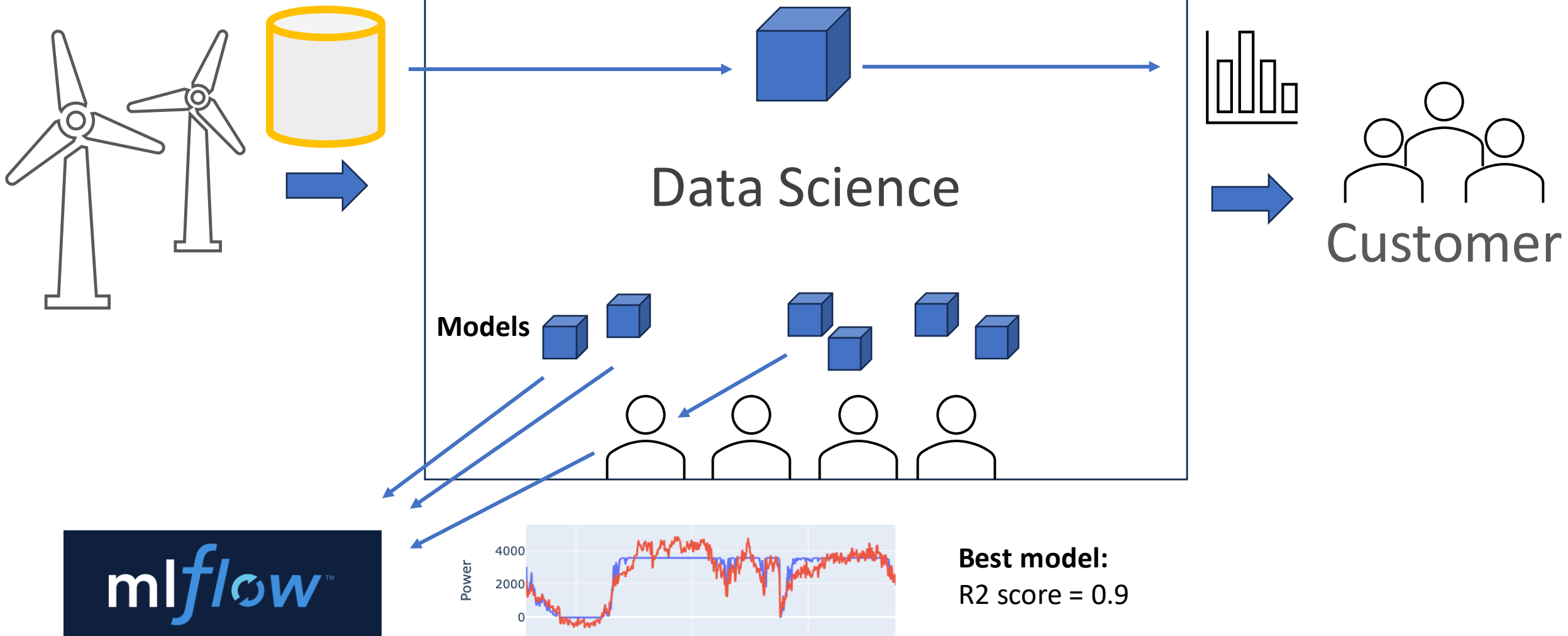


Data Science



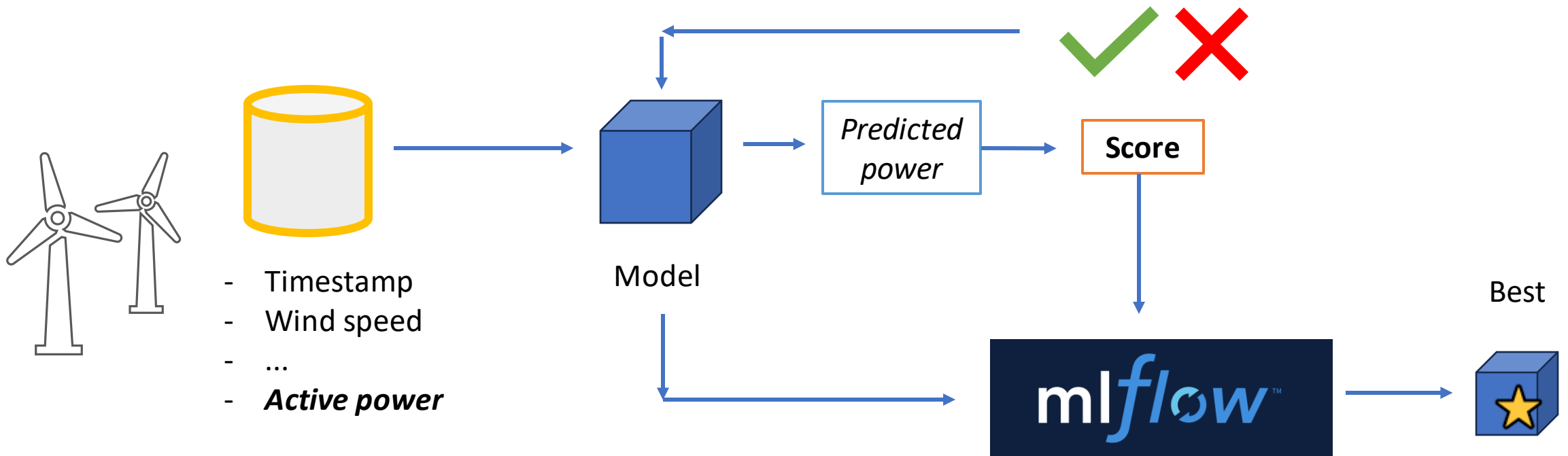
Customer

Why Experiment tracking?



Demo : setup & experiment tracking

Demo 🧑🔬: setup & experiment tracking








Hands-on 🧑💻: setup & experiment tracking

1. Navigate to 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

Hands-on 🧑💻: setup & experiment tracking

Wrap up

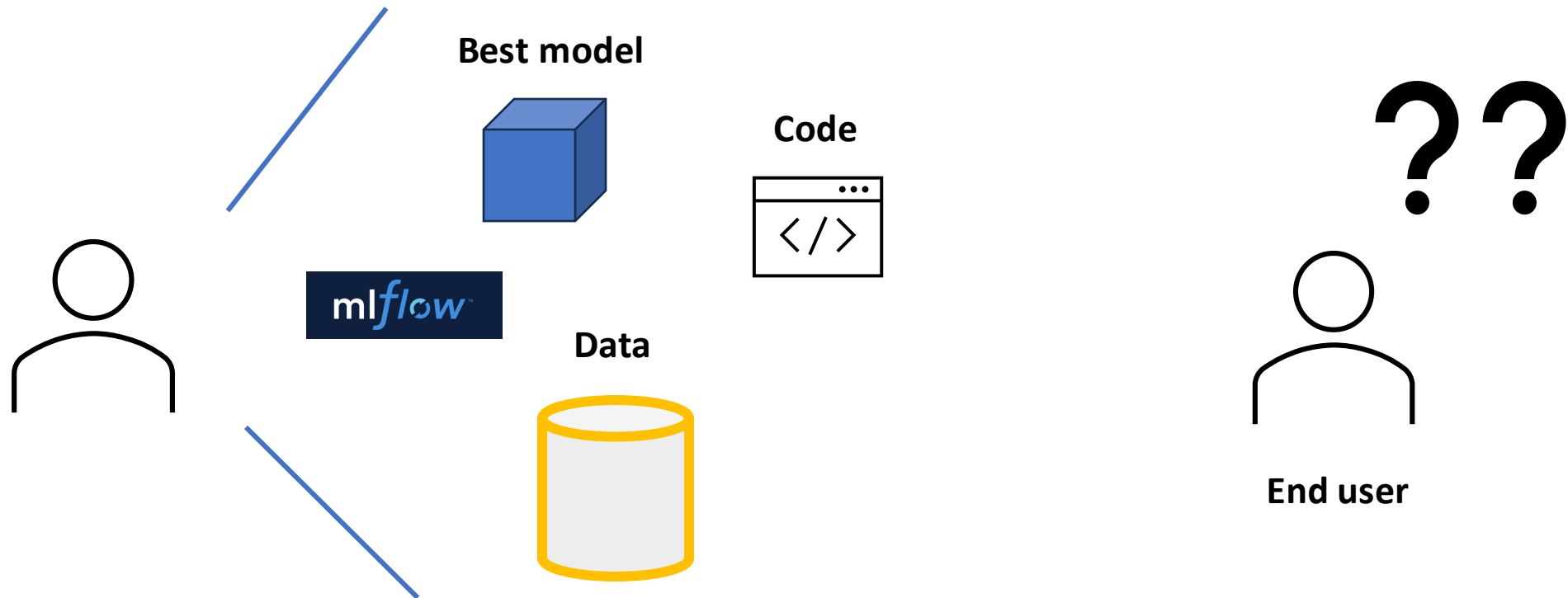
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**Serving the
model**



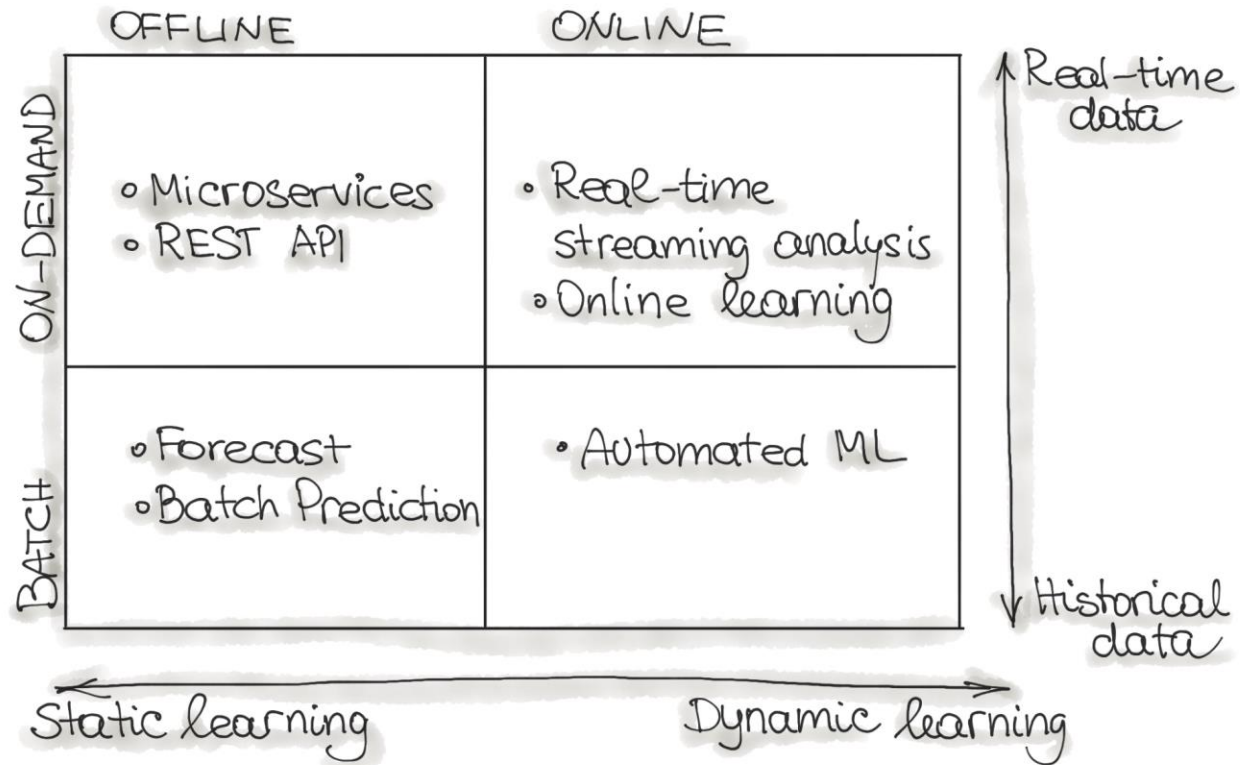
We cannot expect others to run our model...



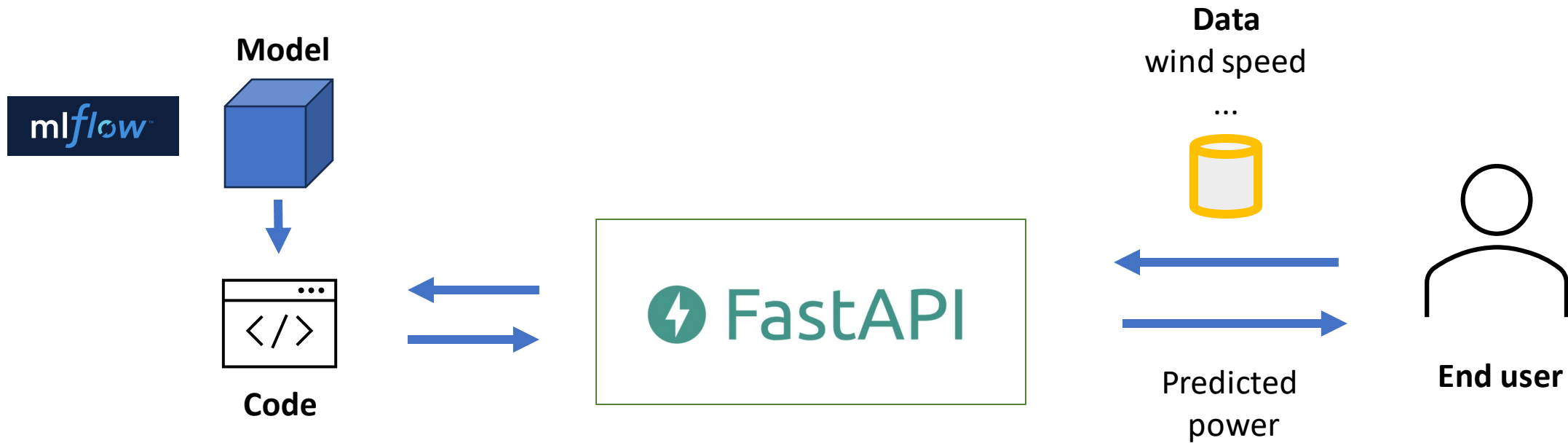
MODEL SERVING PATTERNS

MODEL LEARNING

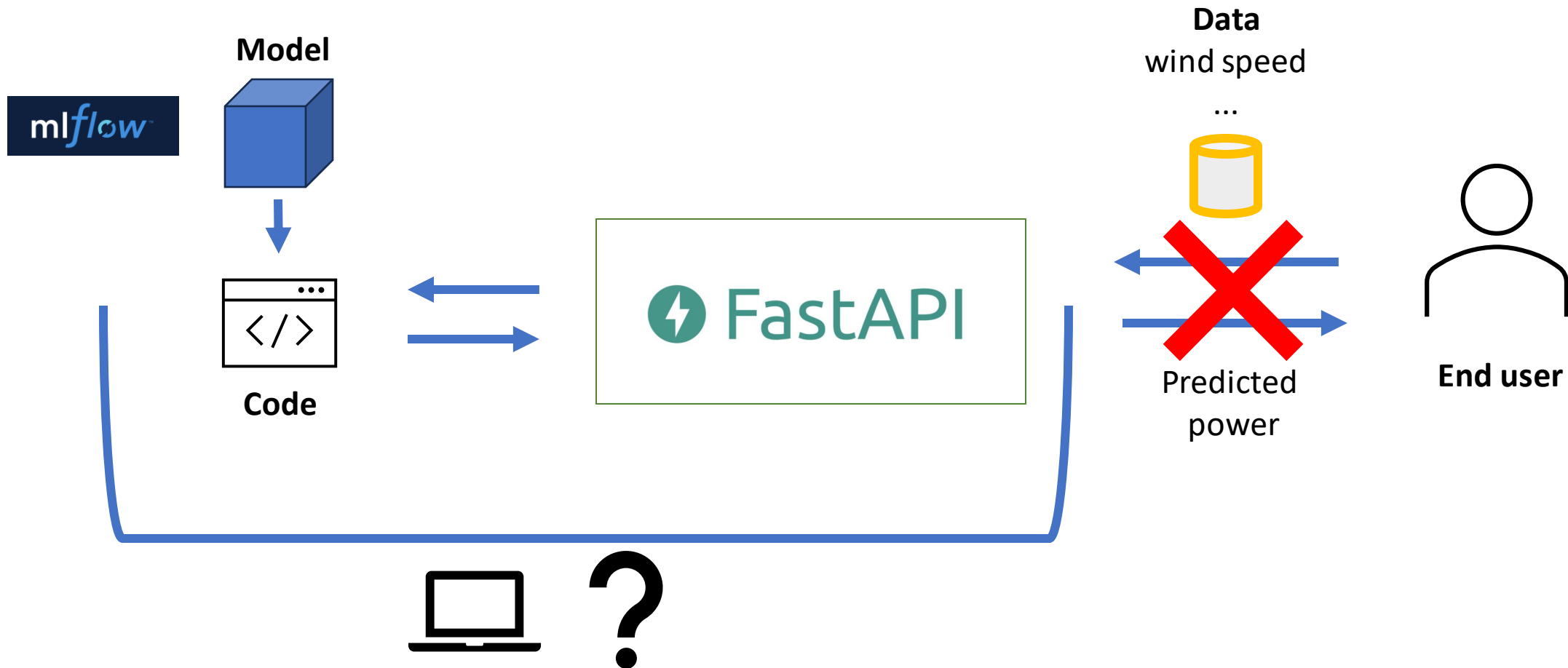
MODEL PREDICTION



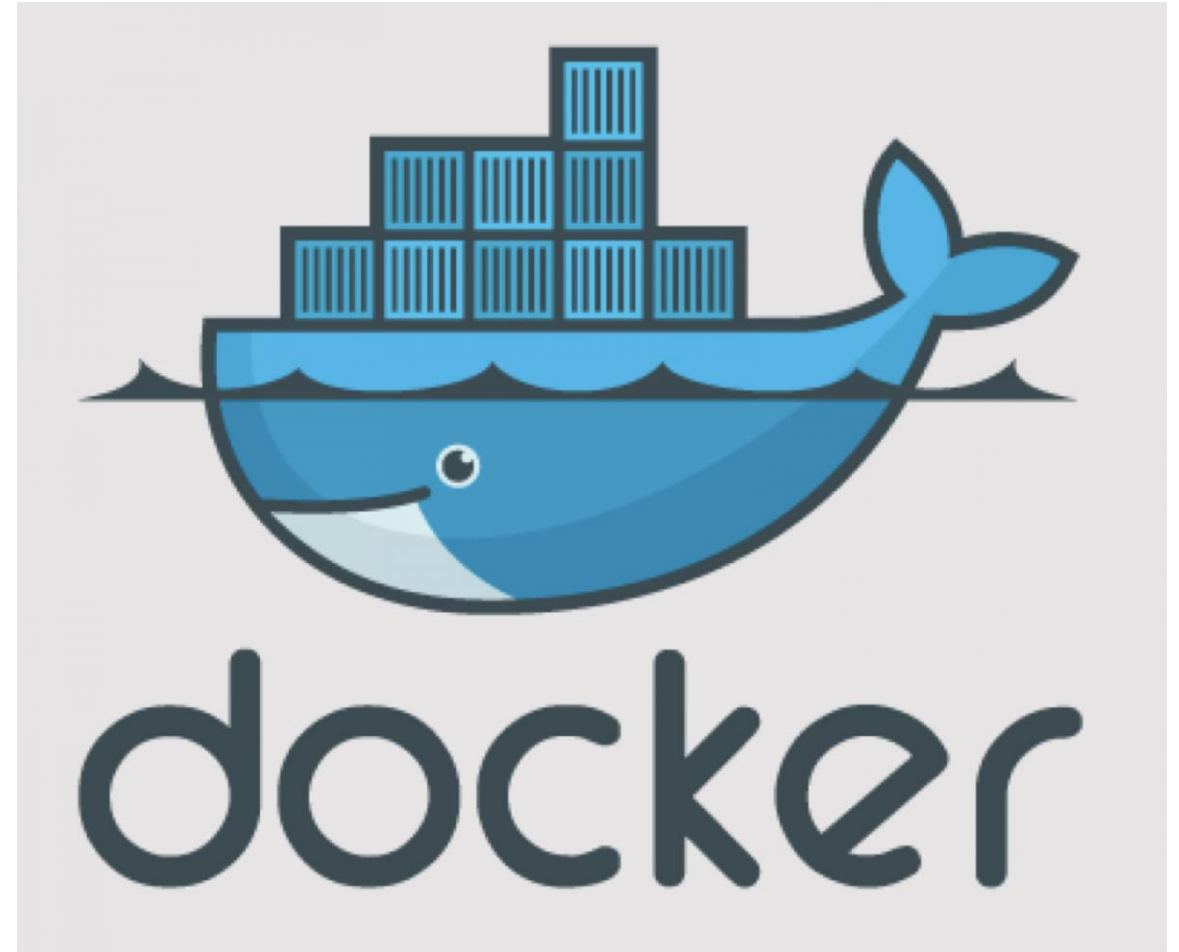
An API allows user to use our model without worrying about the logic behind



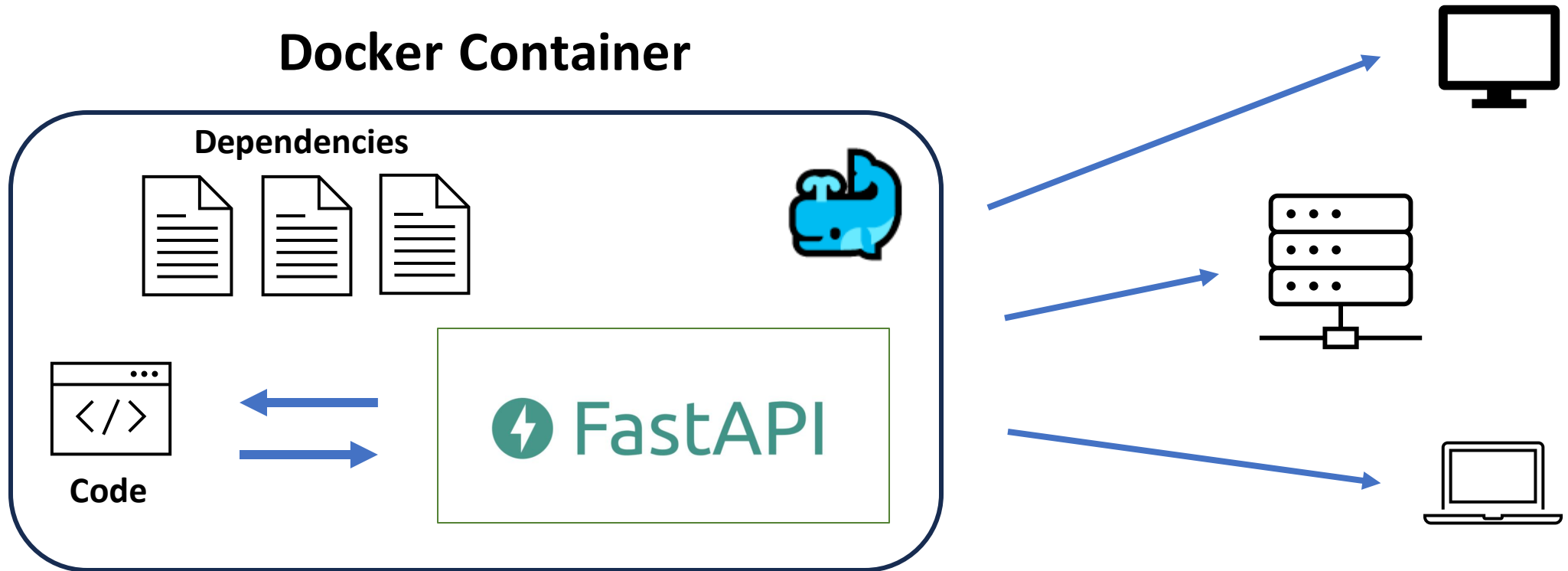
Where to run our API?



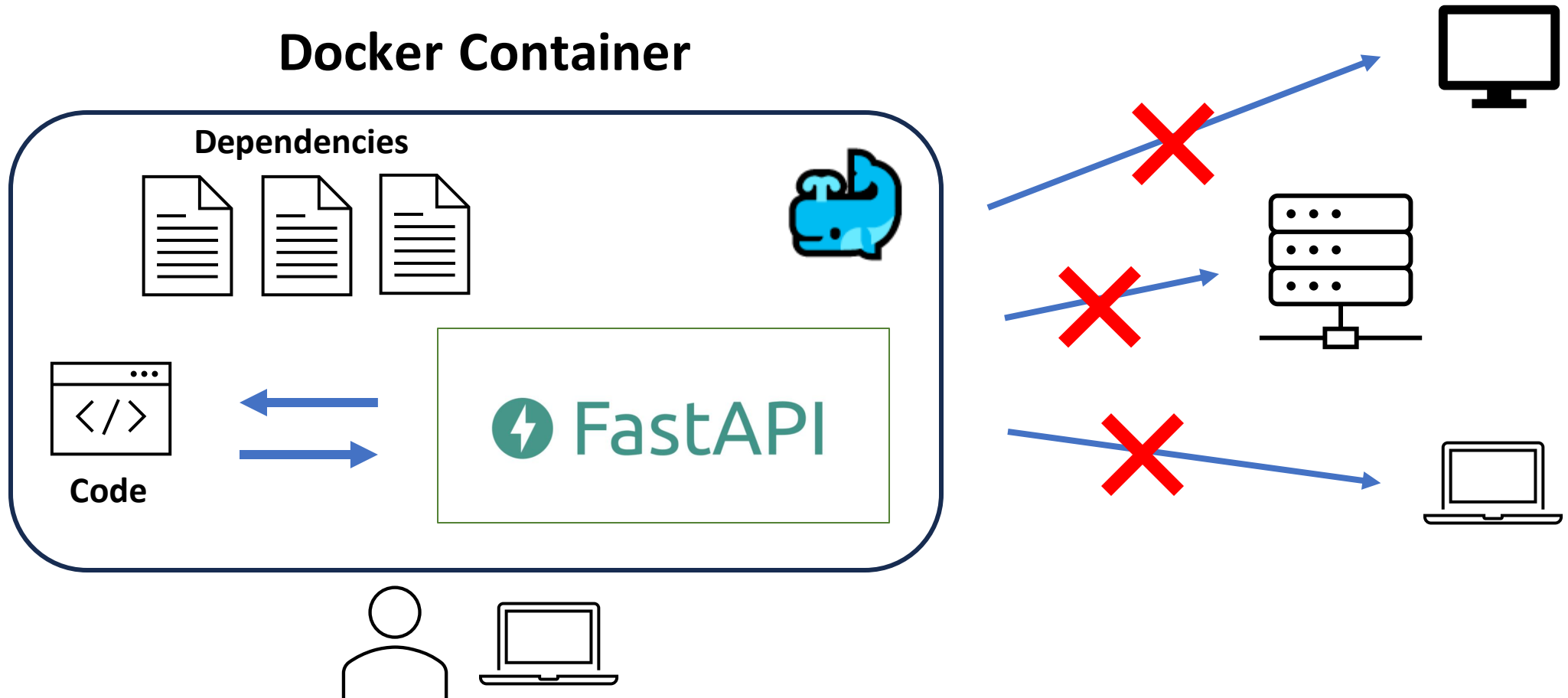
Containerizing our application



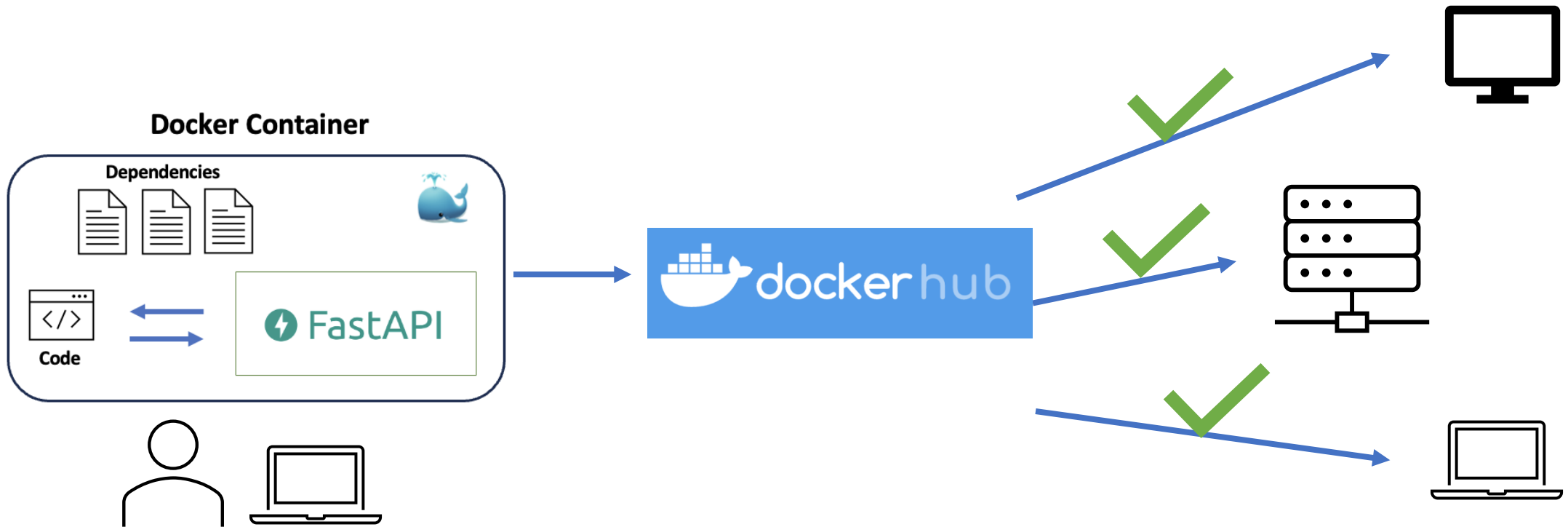
Container allows us to run it anywhere!



But, how do we get it there?



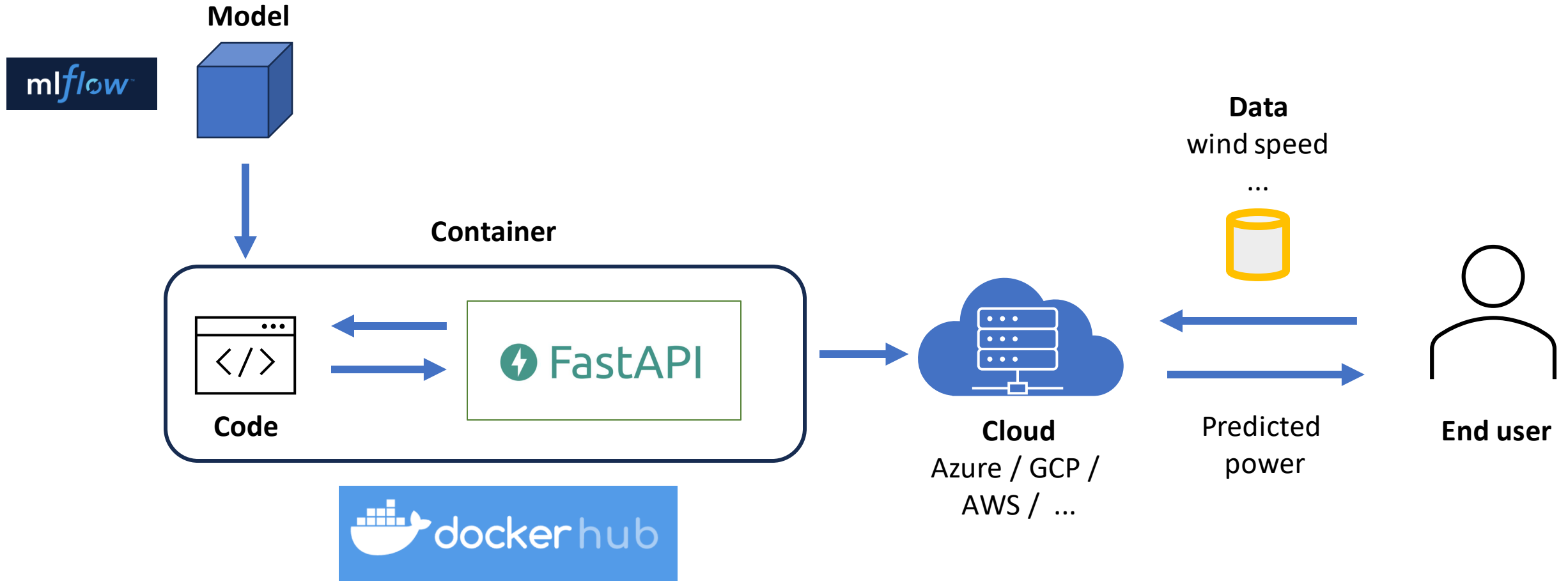
Register it on Docker Hub!



Deployment to the cloud



Running our container in the cloud allows users to access it



Demo : model serving & deployment

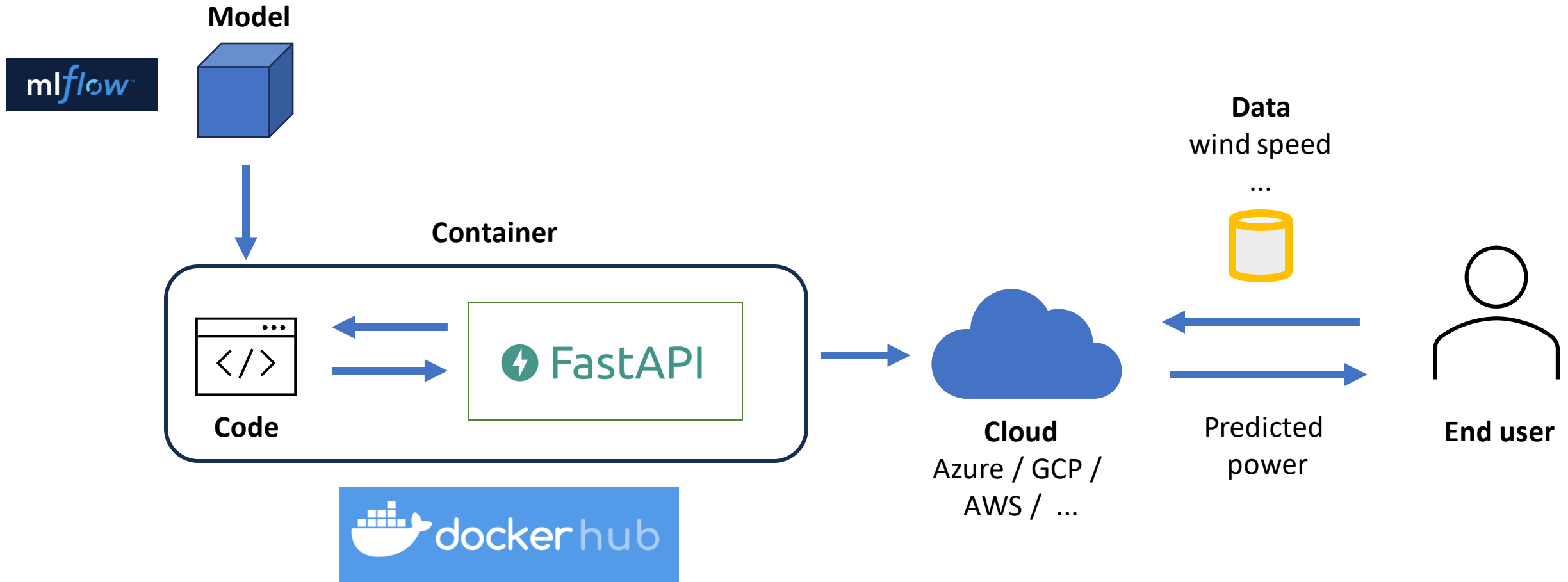
Hands-on 🧑💻: model serving & deployment

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

Hands-on 🧑💻: model serving & deployment

Wrap up

Started from notebook, ended with ML application





Thank you!

What's your tip and top?

→ Come and chat! 

