UbiOps

WSAI Montréal 2023

Deploying AI models at scale

Building production-grade AI / ML products.

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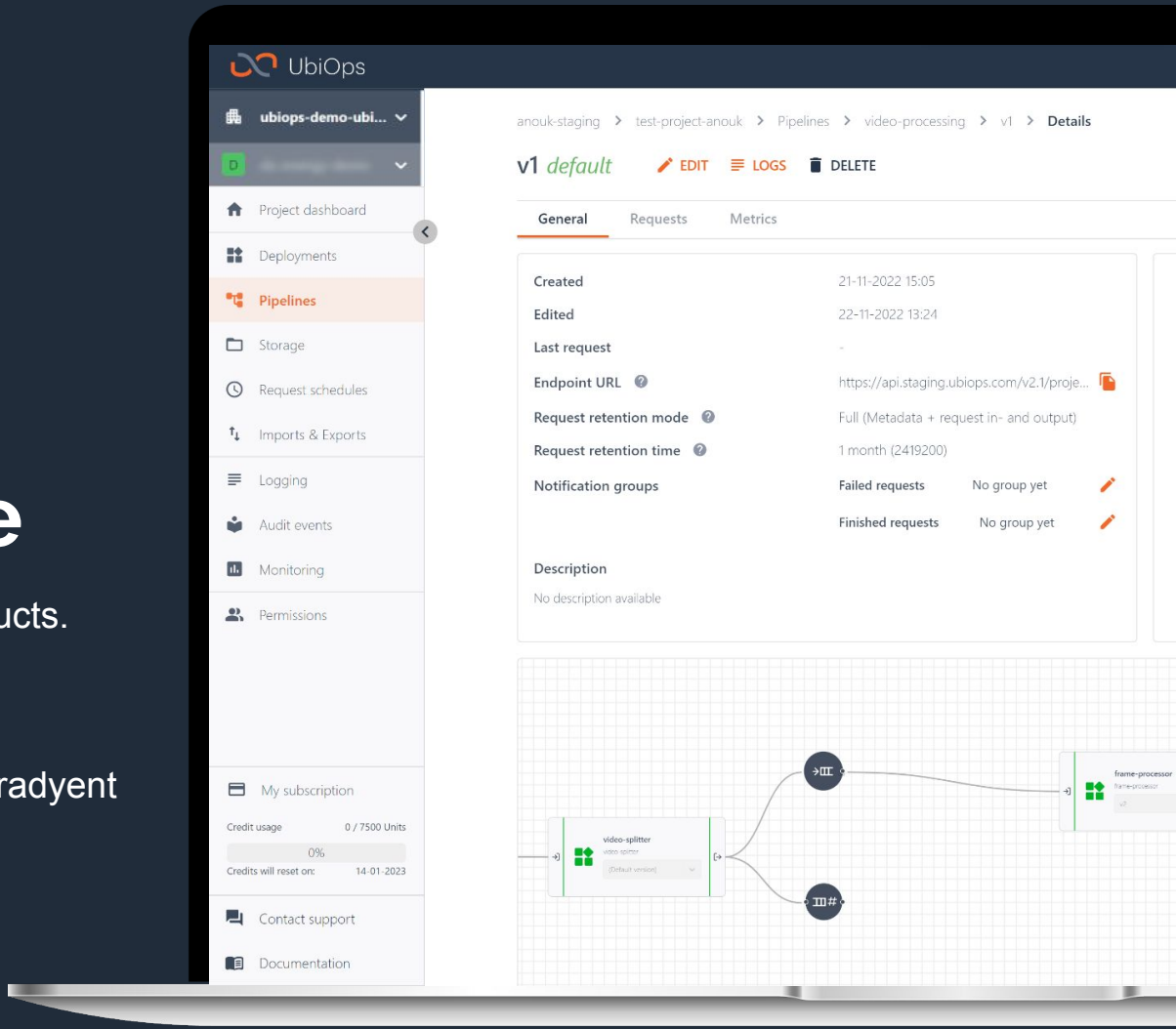

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/ There is a huge growth in AI services. Many businesses want to turn **ML & AI models into** products**.**

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Productionizing AI & ML: The next big thing?

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/ **Inference** is becoming more important than **training.**

We're entering a new era of AI applications

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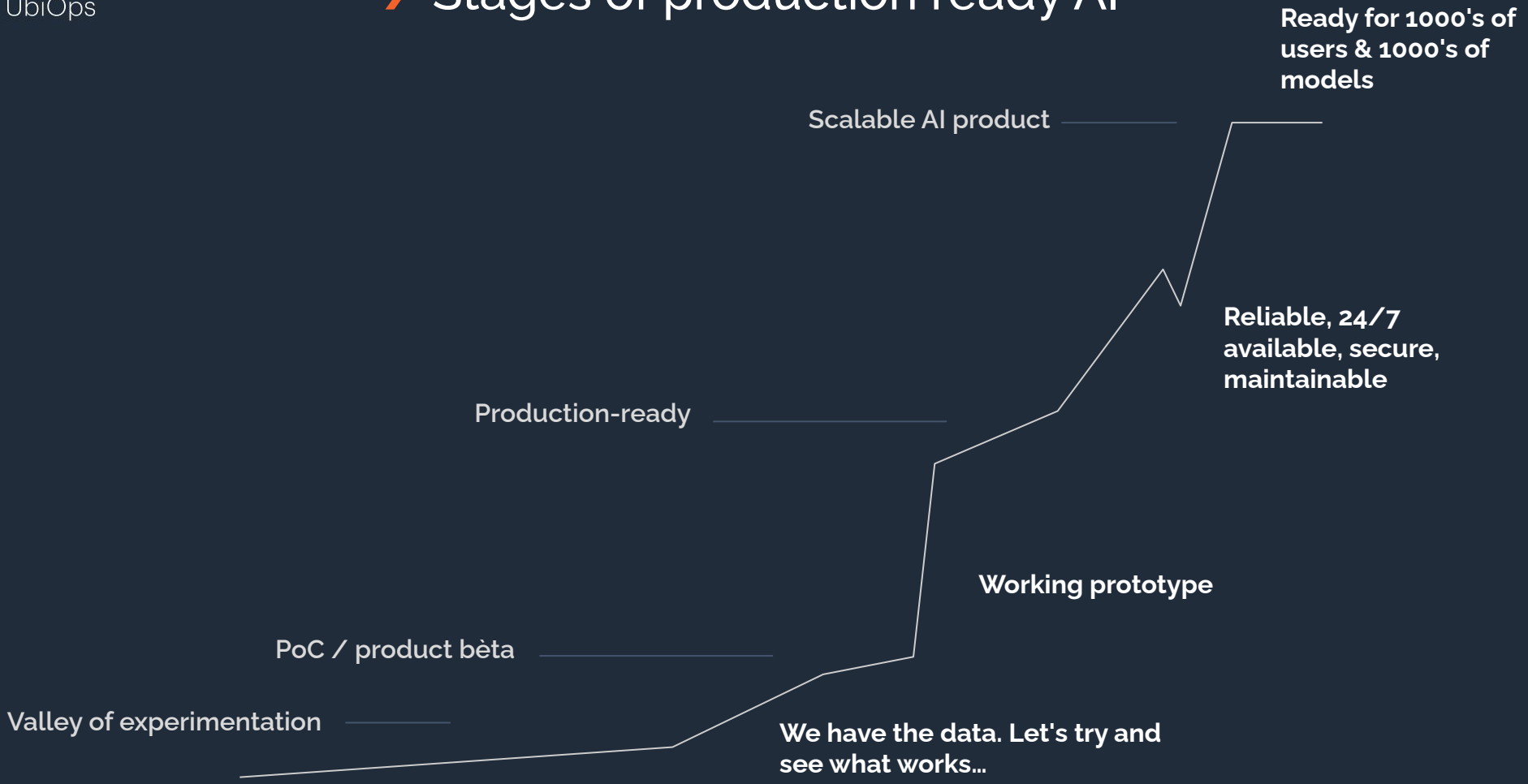
/ Stages of production ready AI



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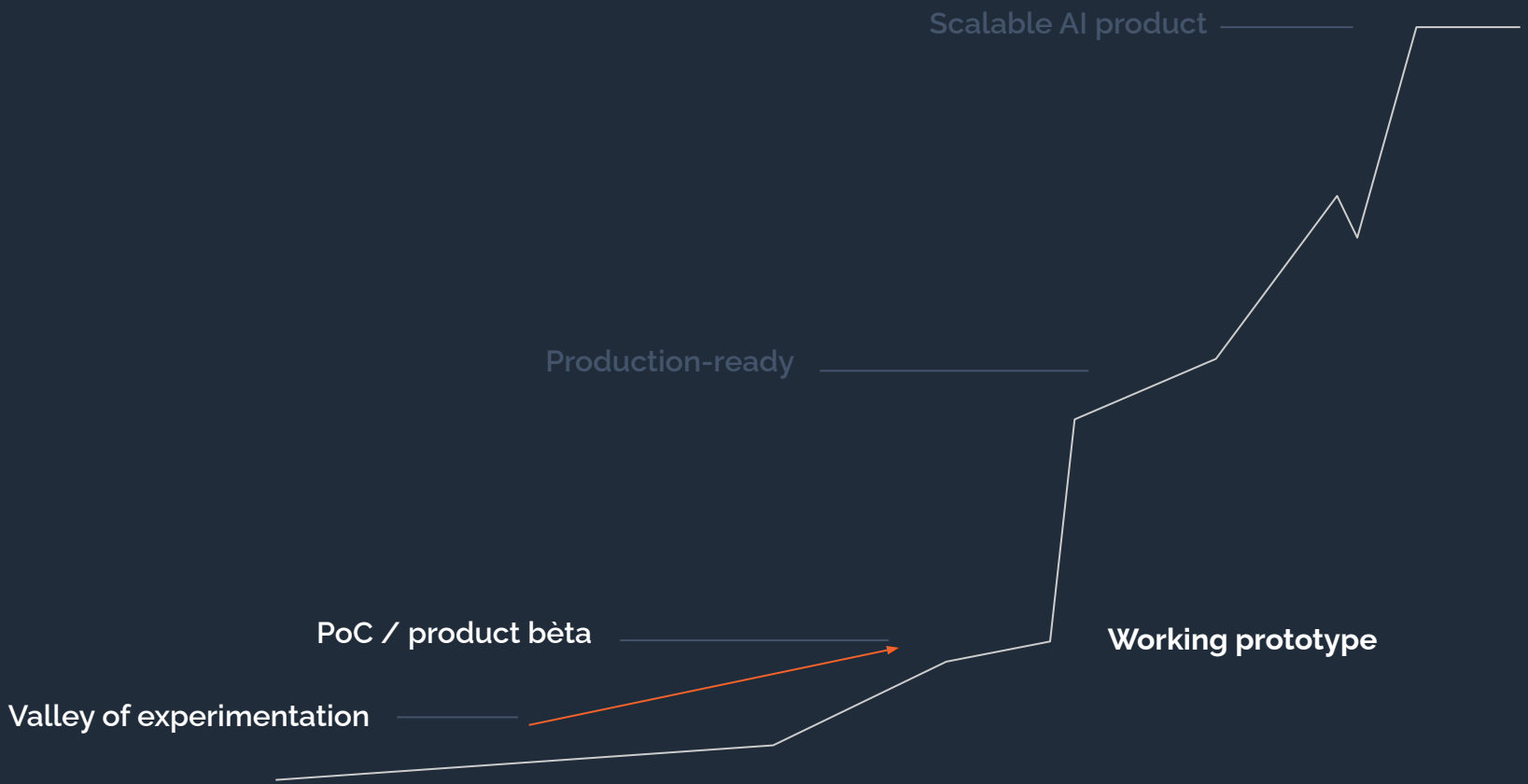
Stages of production ready AI



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/ **Foundation models** will change how we approach AI system development. But there are also **thousands** of business cases that need a more traditional data science approach.

"*Not everyone is Google*"

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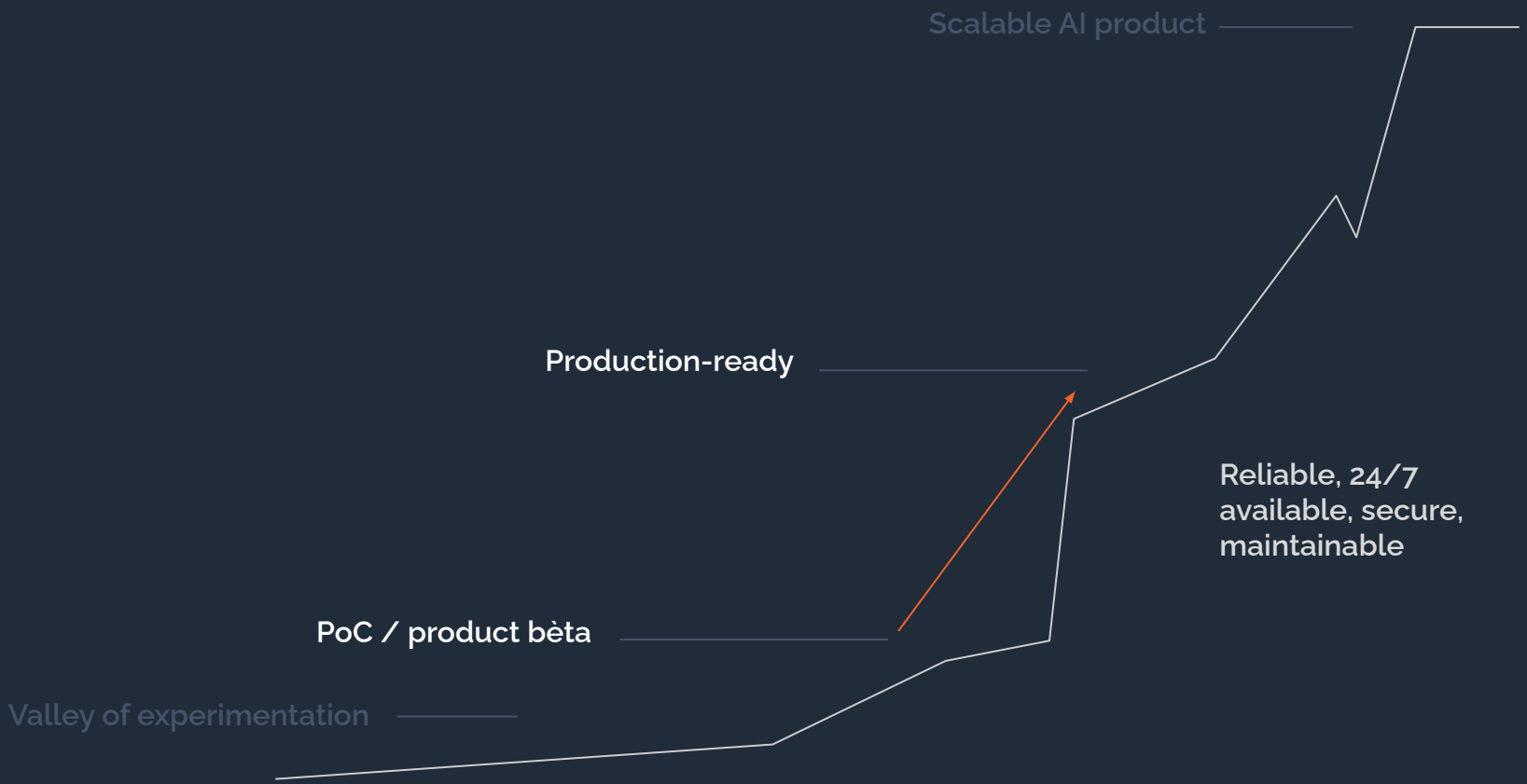
From PoC to a model in production



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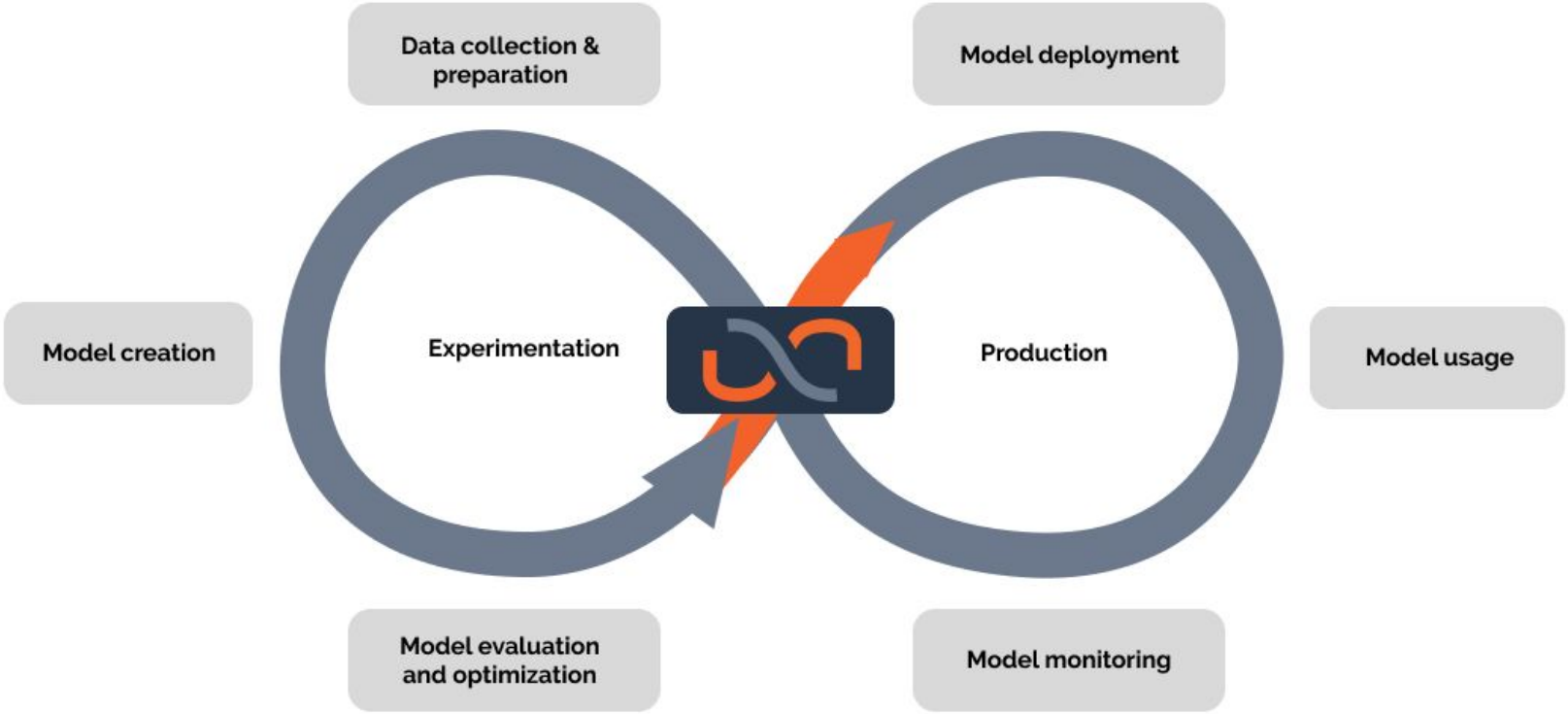
/ What does **productionization** even mean?



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In the end, with AI in production, teams suddenly need to care about **reliability, uptime** and **security** of their solutions

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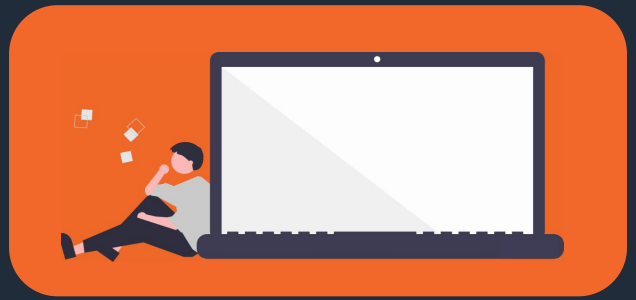
/ What does **productionization** even mean?

New, non AI / ML related things to deal with

- Reproducibility *("It worked on my machine this morning …")*
- Maintainability *("Was it 'churn_v5_thisone.py' or 'churn_v5_final.py'…?")*
- Robustness *("Let's hope they don't kill our spot instance during the demo… ")*
- Security & compliance *("Do we have someone named Cody in our team??")*



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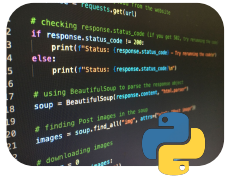
/ The **AI model** stays the same, the complexity of the solution explodes

AI Model



+

IT infra

User & permission management

Auto scaling

Security

?!

Integrations

kubernetes

docker

Server configuration

Logging & monitoring

Code dependencies & libraries

Version control

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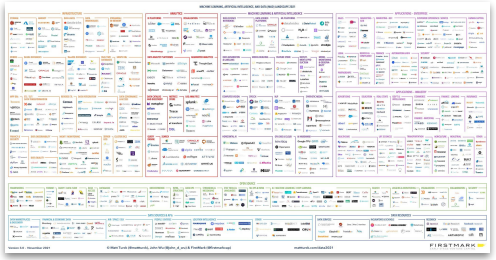
/ Solving the model deployment challenge



MLOps/ModelOps 2

Tools, technologies, and practices to deploy, monitor, and govern ML/AI algorithms and other analytical models in production-grade applications.

1 **Data Science**

3 **Infrastructure**

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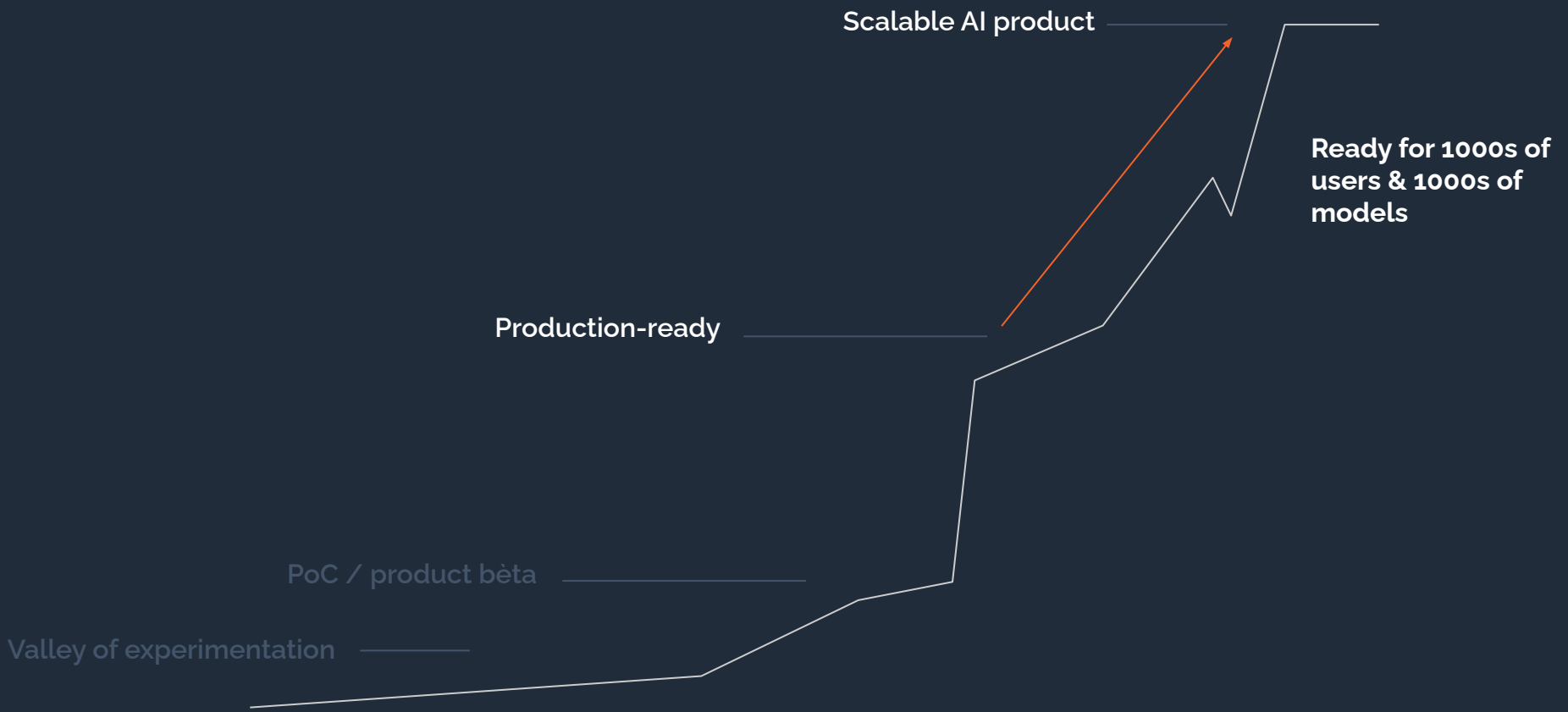
Scaling it up (and down)



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/ Scaling **up**

More non AI / ML related things to deal with

- Automatic scaling *("We need to be ready for all those new users")*
- Cost efficiency *("What's wrong? Ah, he saw the cloud bill…")*
- Resource availability *("What do you mean, they ran out of GPUs ?!")*
- Hybrid cloud *("This data can't move to the cloud…sorry")*

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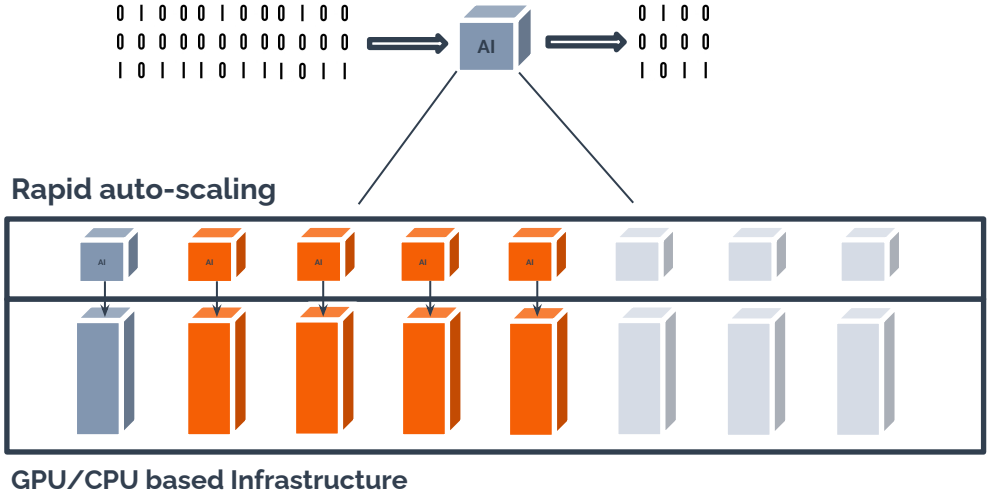
/ Scaling up...

Making sure the AI service scales with demand. Ensuring it can deal with spiky usage without the whole solution going down



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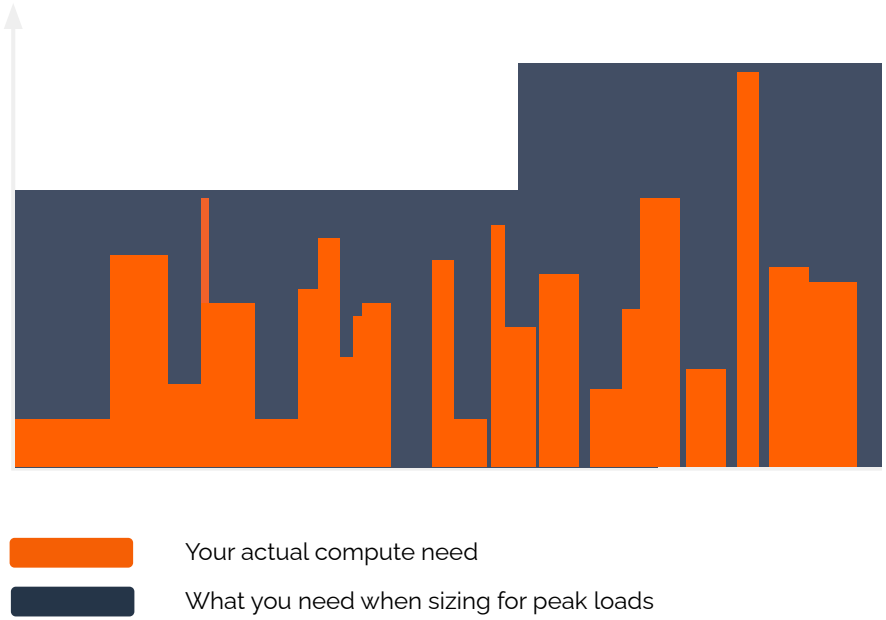
/ ...and scaling back down

Scaling up and down (back to zero) rapidly ensures you follow your compute demand curve as close as possible, optimizing resource usage



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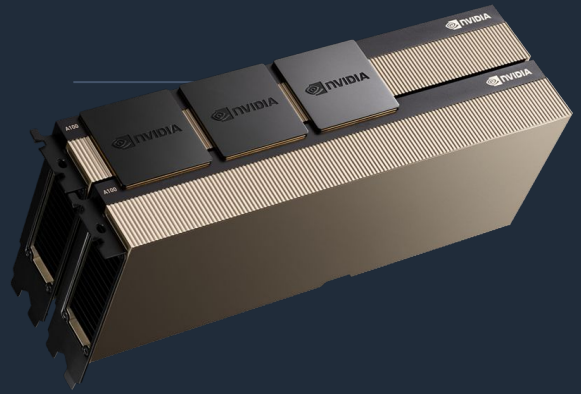
Resource availability

Challenges with GPUs

- Necessary for acceleration of AI models (and training)
- They're expensive
- Sharing a GPU between containers is not easy
- Issues with GPU availability, driven by supply chain issues and AI models that get heavier and heavier



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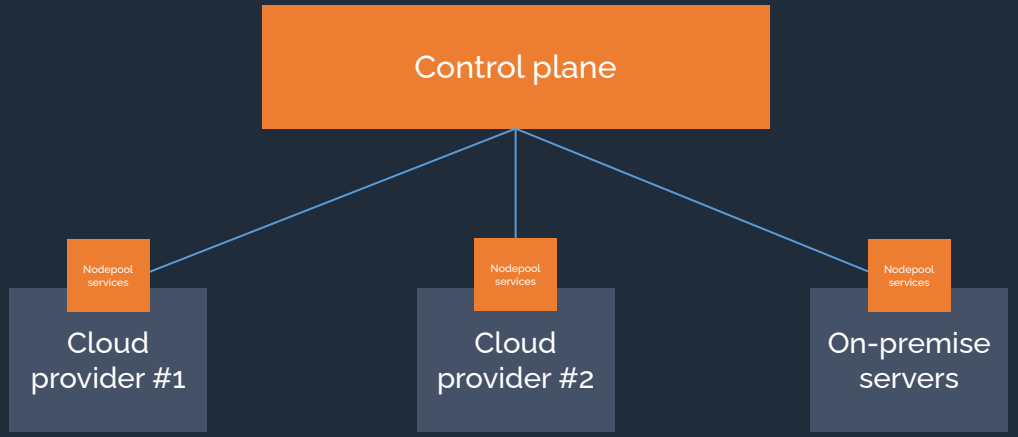
/ Run across environments: Hybrid & multi-cloud

Enabling to lift and shift workloads dynamically across different environments.

- Higher availability of resources (and GPUs)
- Bring compute to where the data is.
- Solve compliance and security blockers



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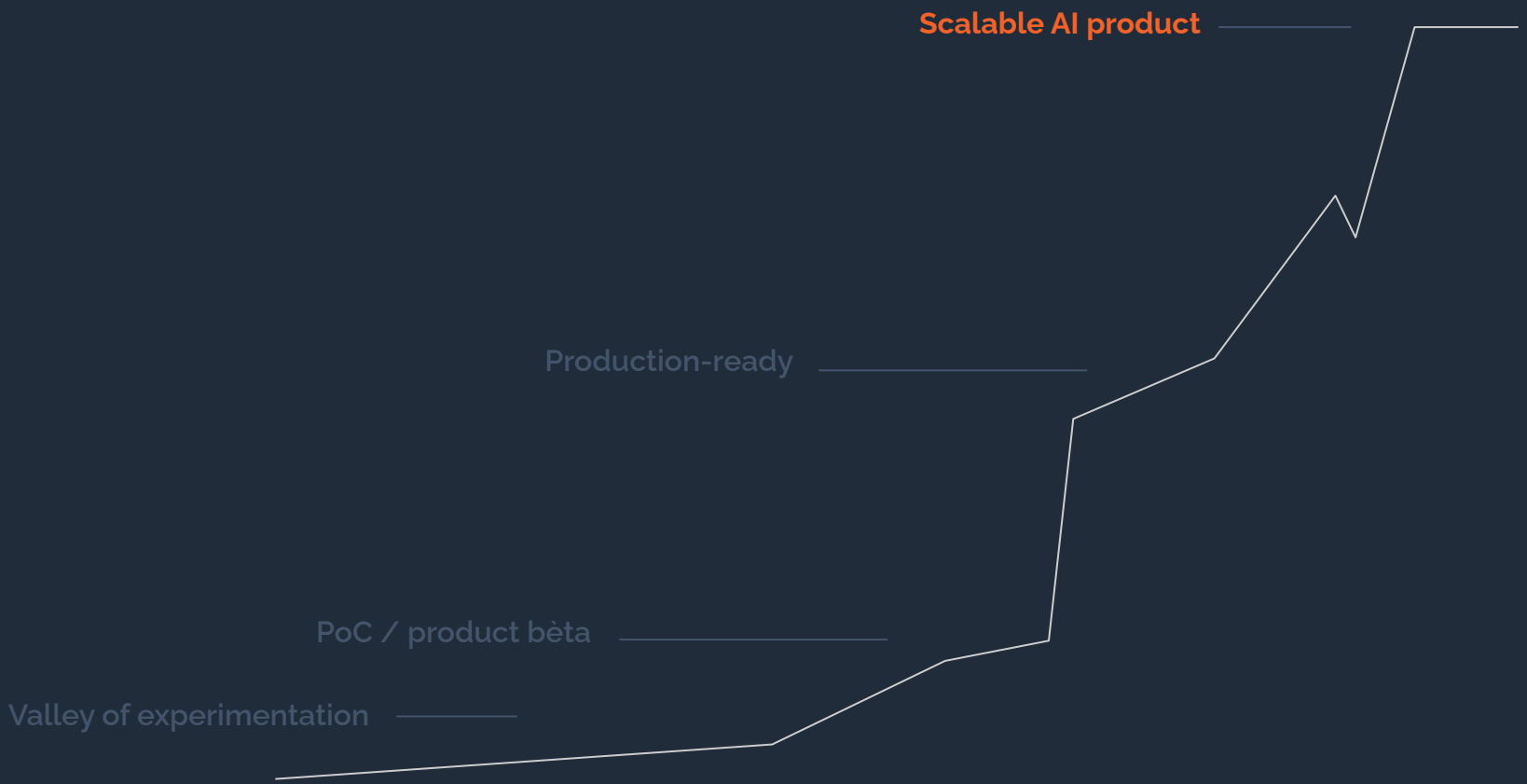
/ Reaching the summit

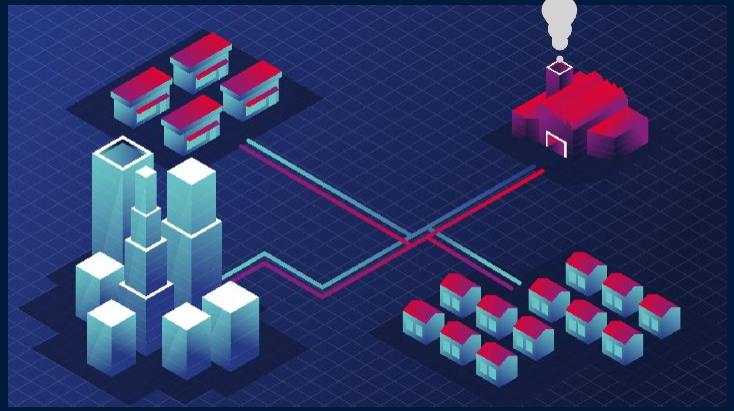


Gradyent

Usecase
Gradyent Digital Twin for heating grids

Tanja Crijns

District and industrial heating networks need to transform



High temperature & losses

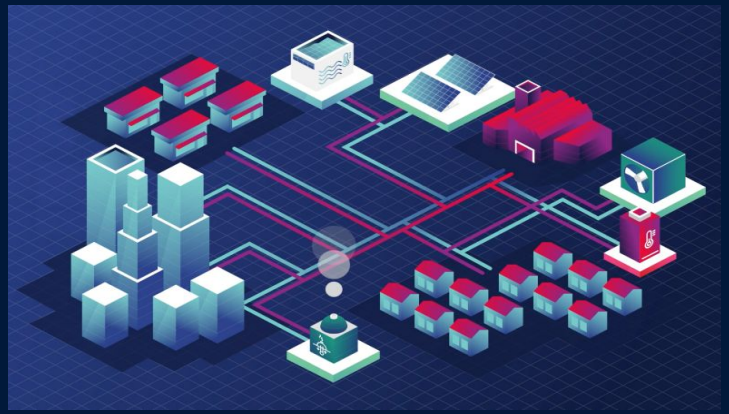
Single / few heat sources

Stand alone

Optimize

Decarbonize

Grow



Lower temperatures

Multiple, different types of heat sources

Integrated with industry, electricity & cooling

Gradyent

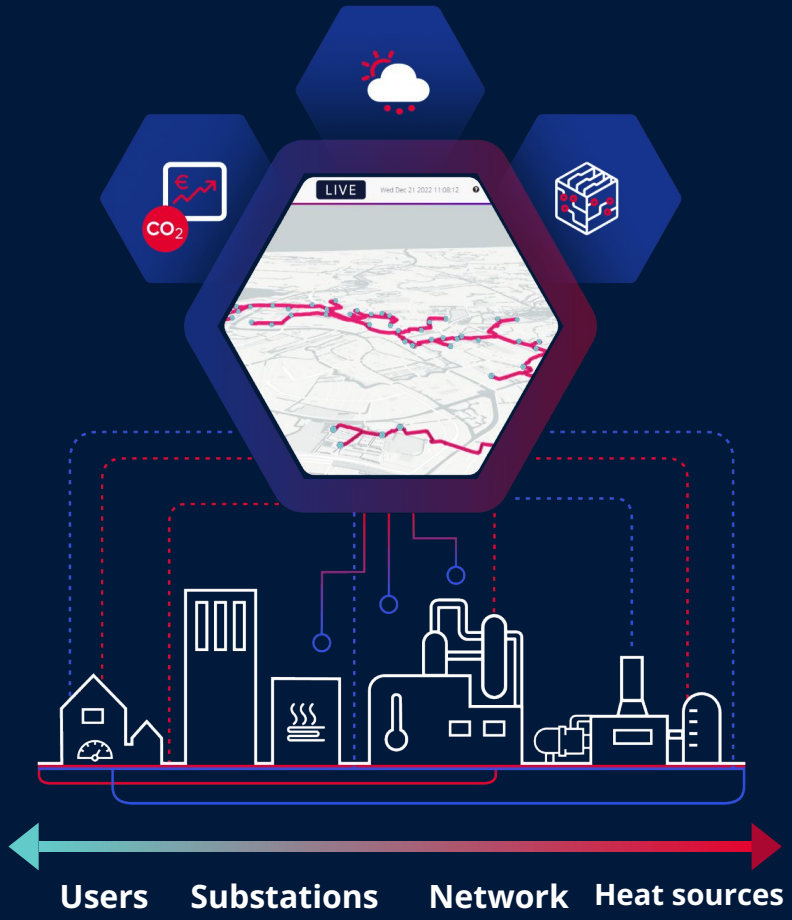
The Gradyent Digital Twin brings a new level of optimization & design by covering the entire system in real time

Real time operational optimization

By optimizing source scheduling, temperatures and pressure, debottlenecking, demand response, issue resolution

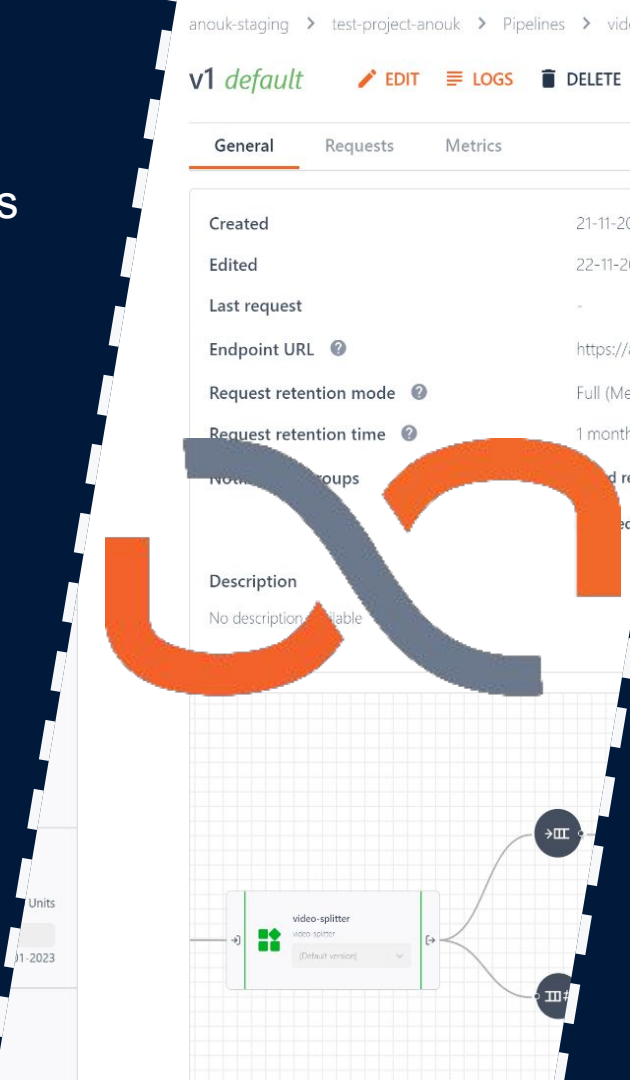
Design & simulation of future proof networks

Enhancing decision making around low carbon sources, system changes and extensions



Gradyent

UbiOps provides an abstraction layer between our engineers and the cloud



Gradyent

Gradyent - Five key benefits

- Ease of use
- Fast paced development
- Production grade stability
- Security and compliance
- Clear insight in compute usage

Gradyent

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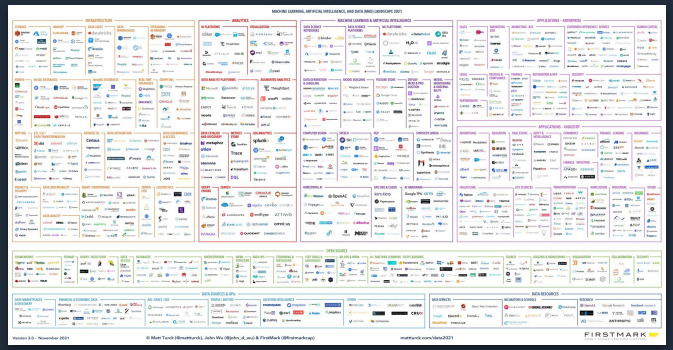
Fast track to productized AI



Scalable AI product

Production-ready

PoC / product bèta

Valley of experimentation

- Short time to market
- Lower costs
- Increased reliability and maintainability of a solution

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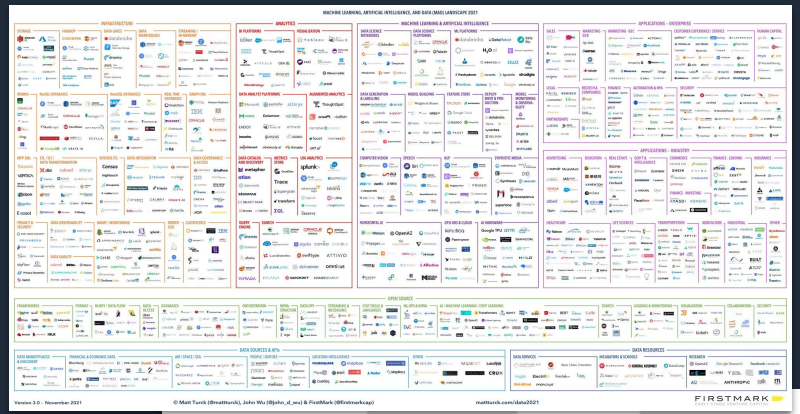
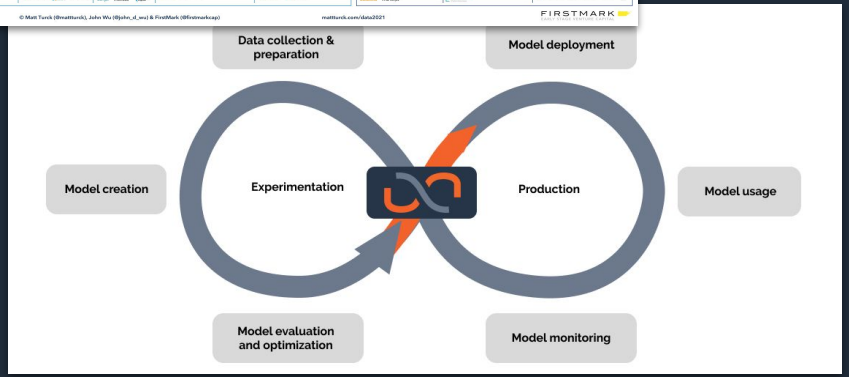
/ The future for AI products





- A **new reality** where implementation of AI has a significant impact on competitiveness, market share and profitability.
- The MLOps ecosystem is expanding rapidly
- Teams will start picking their own preferred stack of tools
- Inference will become increasingly important
- Foundation models will drive product creation, but also hardware and accelerator needs

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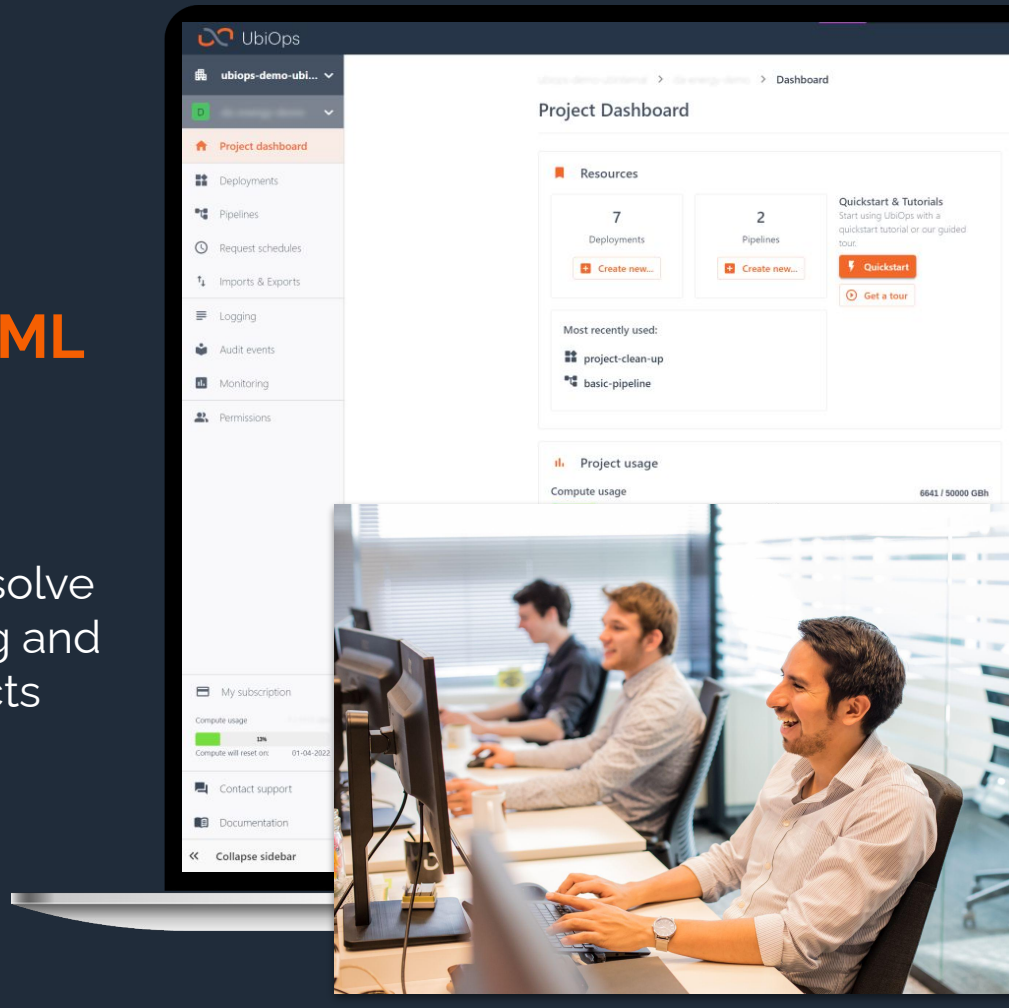
Build production-grade AI / ML products.

Our mission is to help teams of all sizes solve the technical challenges around building and running the next generation of AI products and services



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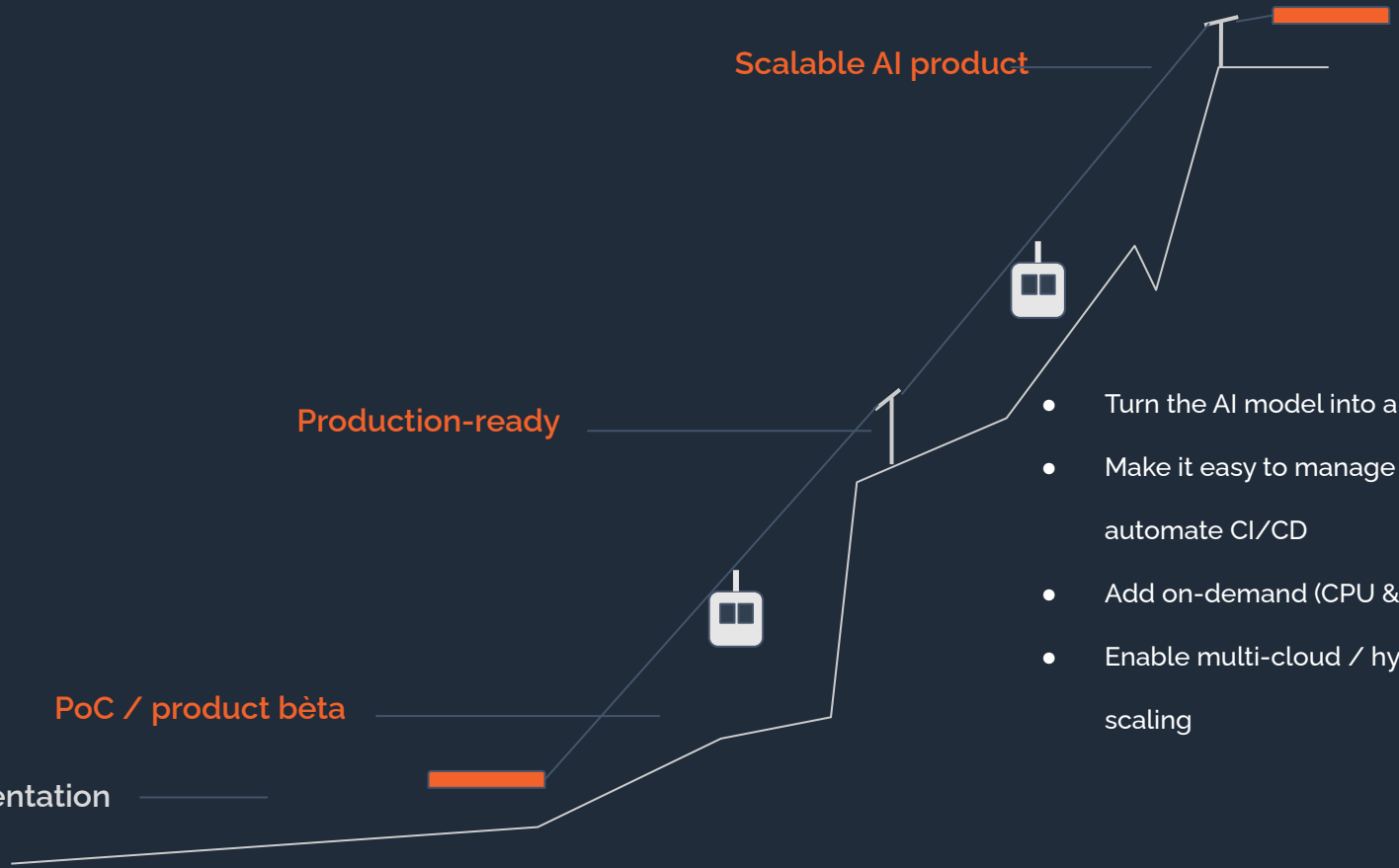
/ Fast-track to production ready AI



- Turn the AI model into a microservice
- Make it easy to manage its lifecycle and automate CI/CD
- Add on-demand (CPU & GPU) compute
- Enable multi-cloud / hybrid-cloud scaling

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Thank you!

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Meet us at booth A70