Venezia

30 GENNAIO 2025

Managed vs non managed AWS solutions, or: I hope that I’m making the right choices

Rosilari Bellacosa
CTO @ SynDiag

It’s me, hi!

Former neuroscientist 🐭
Former ML specialist
Former R&D in Computer Vision
Current CTO @ SynDiag

A few facts about SynDiag

Launched in 2018

3 founders

10 people

PoliTO Spin Off

5 IPs protected in 5+ countries

2 products

750K in sales in 2024

MDR, GDPR, ISO compliant

The team @ SynDiag

Daniele Conti, PhD
CEO - founder

Rosilari Bellacosa, PhD
CTO - founder

Federica Gerace, PhD
C-AI-O - founder

Matteo Padovano
Senior SW manager

Pio Raffaele Fina
R&D Manager

Sabrina Scarpati
Sales & BizDev manager

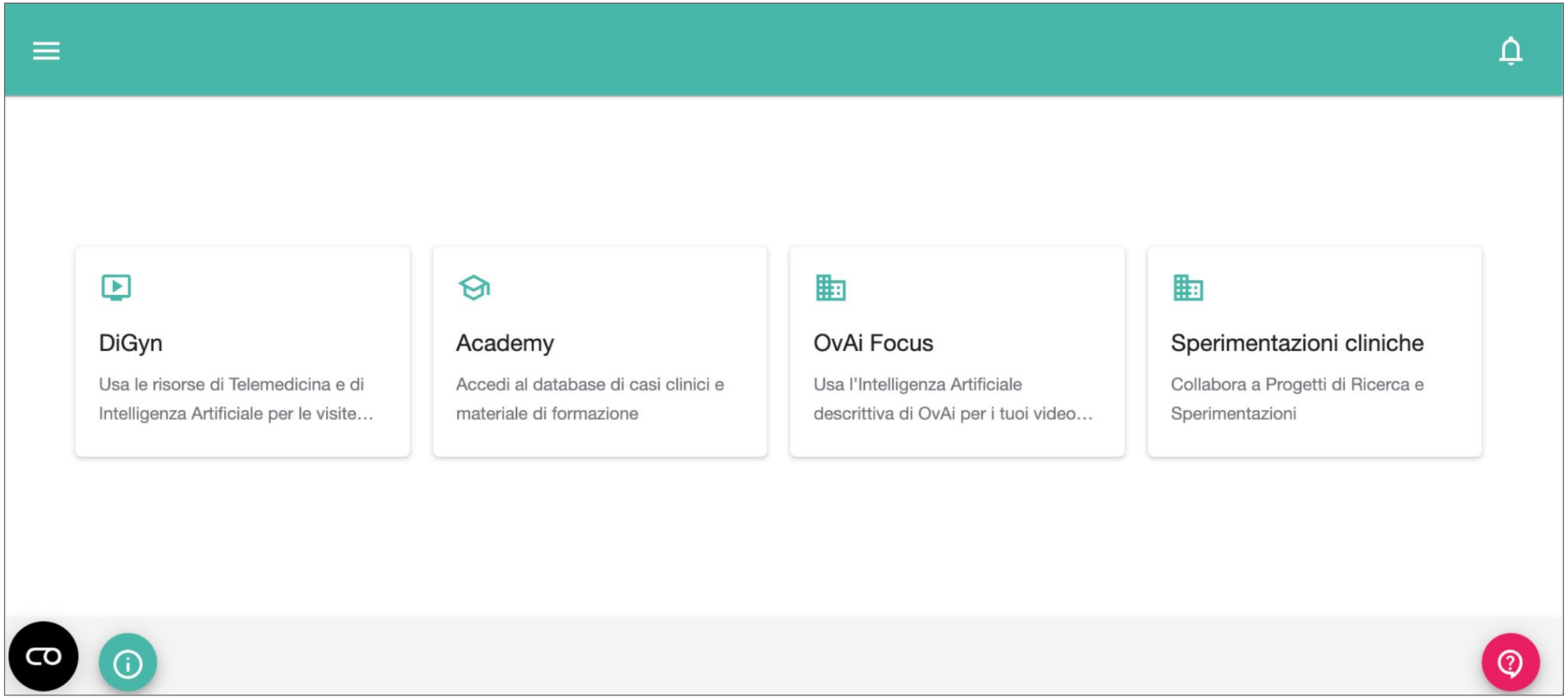
Francesca Salis
Clinical Development manager

Yernur Kushaliyev
AI engineer

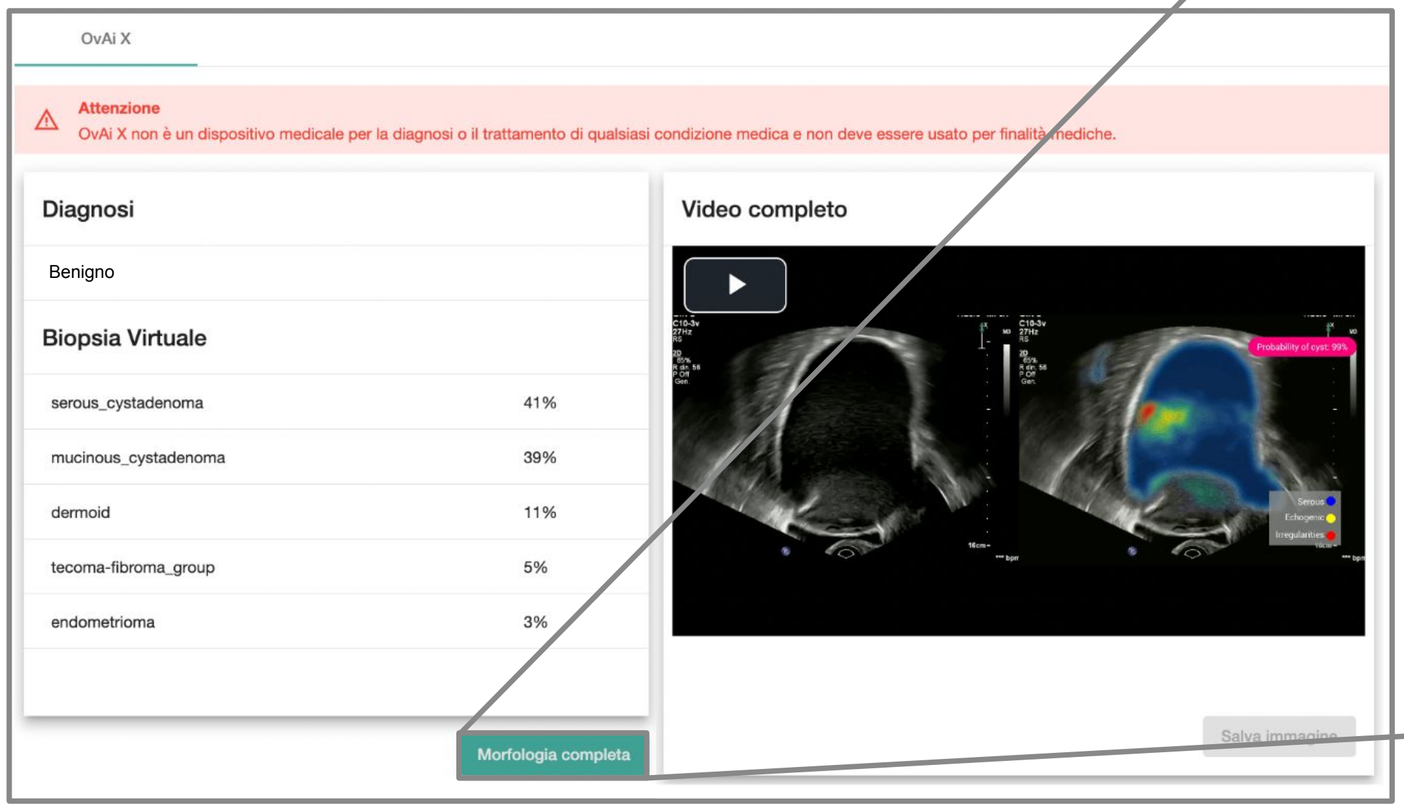
Christian Bardella
AI engineer

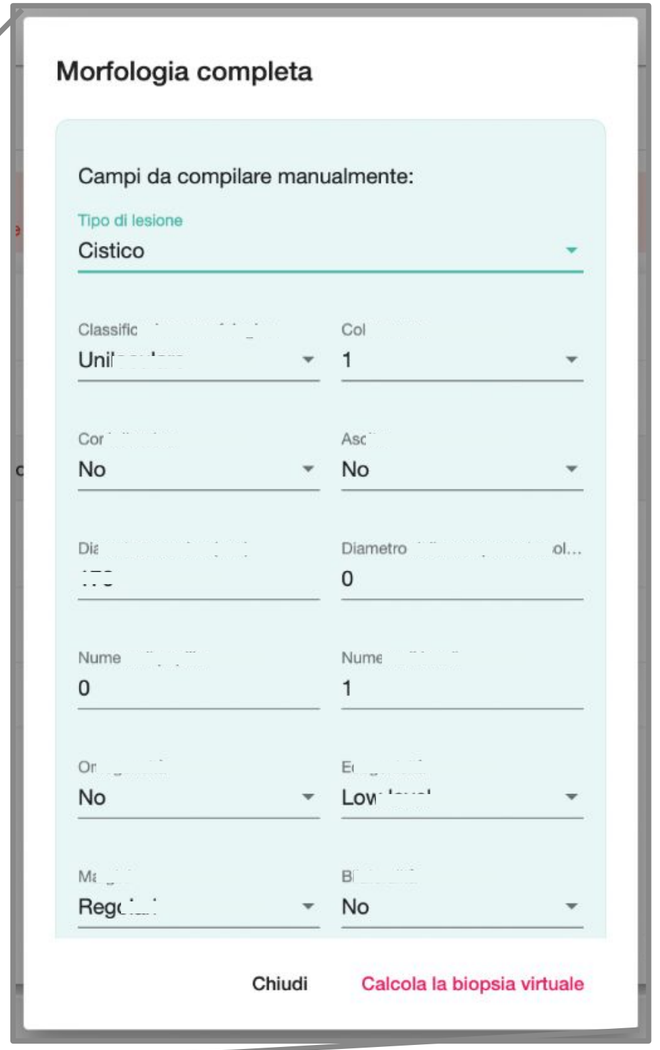
Niccolò Tallone
AI engineer

OvAi platform



OvAi platform





Product offering

Abroad distribution through partners

Women begin the journey with check-ups for all conditions

Control Visits	Ultrasound	Lab Tests	Surgery planning	Biopsy (when possible)	Treatment monitoring
SynDiag	SynDiag	+Partner	+Partner		+Partner

\+ Partner

Product offering

Core/ Medical

Integration/
Non medical

Abroad distribution through partners

Women begin the journey with check-ups for all conditions

Control Visits

SynDiag

Ultrasound

SynDiag

+ Partner

Lab Tests

+Partner

Surgery planning

+Partner

Biopsy (when possible)

Treatment monitoring

+Partner

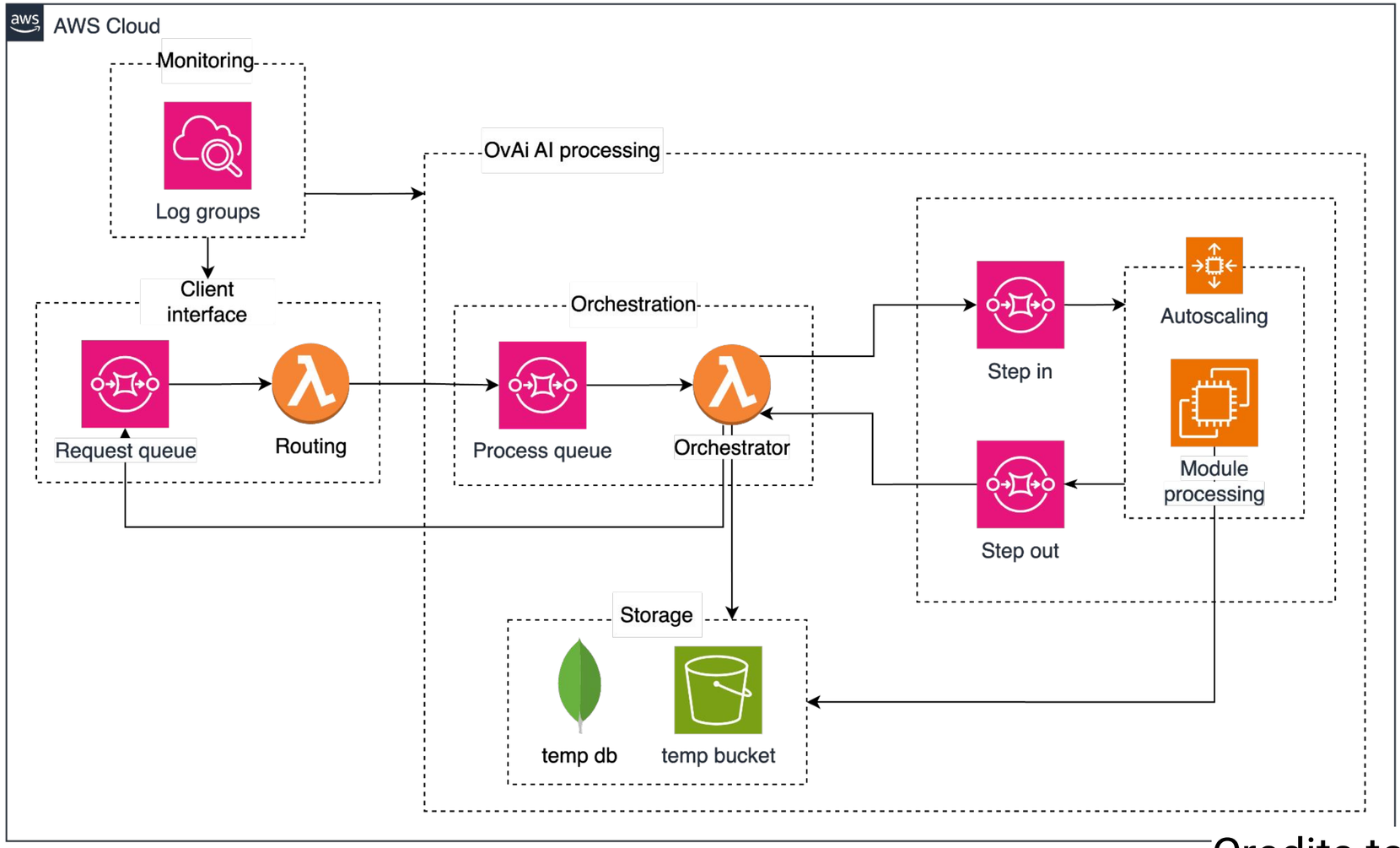
Bottlenecks vs Time to market

Real-world constraints in Healthtech

- Regulatory compliance requirements vs Time-to-market pressure
- Resource optimization 💸 (both human and computational)

Balance between:
Stable, untouched product vs. SaaS

AI: the case for non fully managed solutions



Credits to Datamantix srl

AI: the case for non fully managed solutions

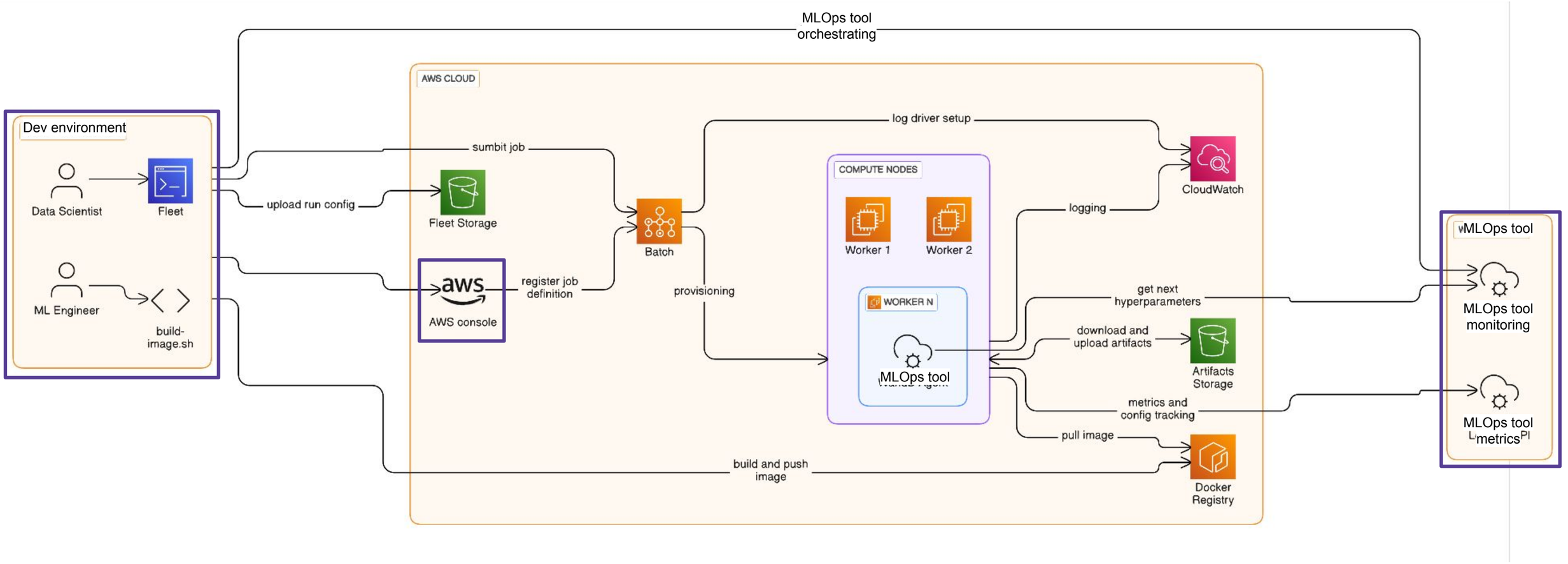
Pros:

Quite general
Familiar technology
Decoupled architecture
Scalability
Fine grain control
Fault tolerance: queues + retries
Open architecture
Portability
Reusability

Cons:

Cold start
Single point of failure
One machine is always on
Complex error handling
Manual implementation of retry logic
(but do we want retry?)
Custom state management
Custom monitoring
Testing

AI: the case for partially managed solutions



Credits to Pio Fina

AI and managed/non managed solutions

Alternatives:

AWS SageMaker, AWS StepFunctions

Scale to zero 👀 🟧 POC level 🟧 Development and deployment costs 🟧 No portability 🟧 Learning curve 🟧 Testing 🟧 AWS specific format

Kubernetes

Scalability 🟧 Dedicated DevOps and Platform team 🟧 High maintenance 🟧 More complex disaster recovery planning

AI and managed/non managed solutions

Costs:

- Depends also on job size (but fixed pricing)!
- Sizable fixed costs + per request costs
- SQS = per call/ free up to 1 mln calls
- Lambda = N modules x request calls (< 0.01$ per request with average 400ms duration)
- EC2 = N modules x machine/hour (avg 200$/month each)
- Temporary storage costs

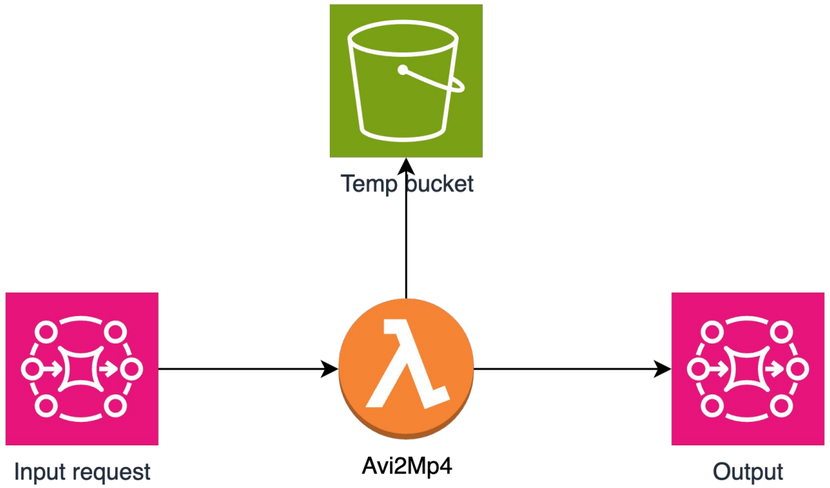
Not sustainable with GPUs

API: towards managed solutions

Why App Runner became attractive:

- No infrastructure management
- Built-in auto-scaling
- Simple deployment process
- Pay per usage, no load balancing

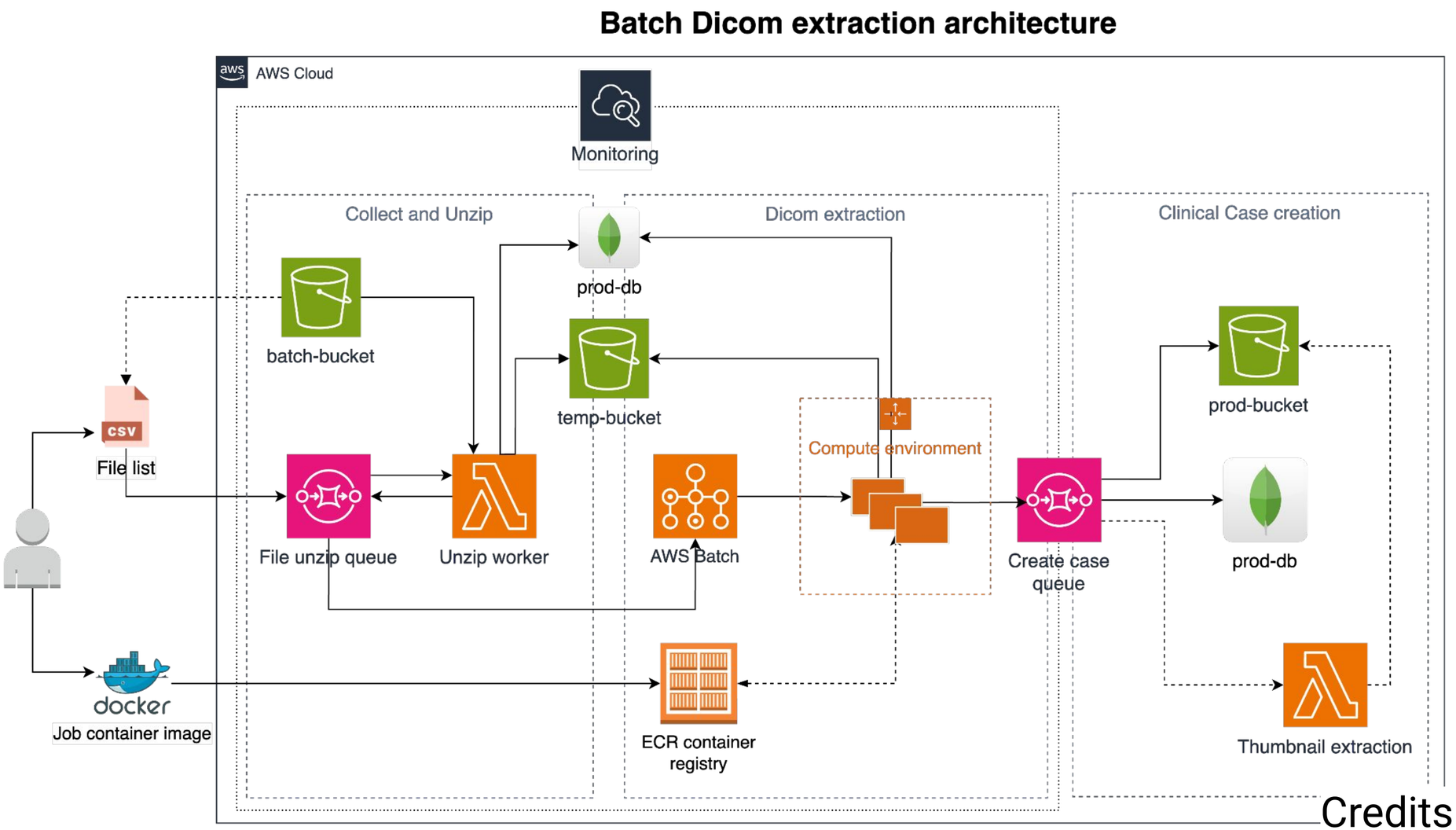
Buy vs build: dealing with media files



Stack:

Cold start issues 🔶 15-minute timeout limitations 🔶 Memory limitation 🔶 Complex error handling 🔶 Maintenance overhead

Buy vs build: dealing with media files



Stack:

Credits to Matteo Padovano

Buy vs build: dealing with media files

Costs:

Lambda solution

- ~0.05$ per request (~10 min duration, 2GB memory)
- Sizable hidden costs

Batch solution

- ECR: negligible traffic, ~0.4$ storage (1GB x image)
- Fargate: ~0.4$ per job (~6 min duration, 4GB memory, 2vCPUs)

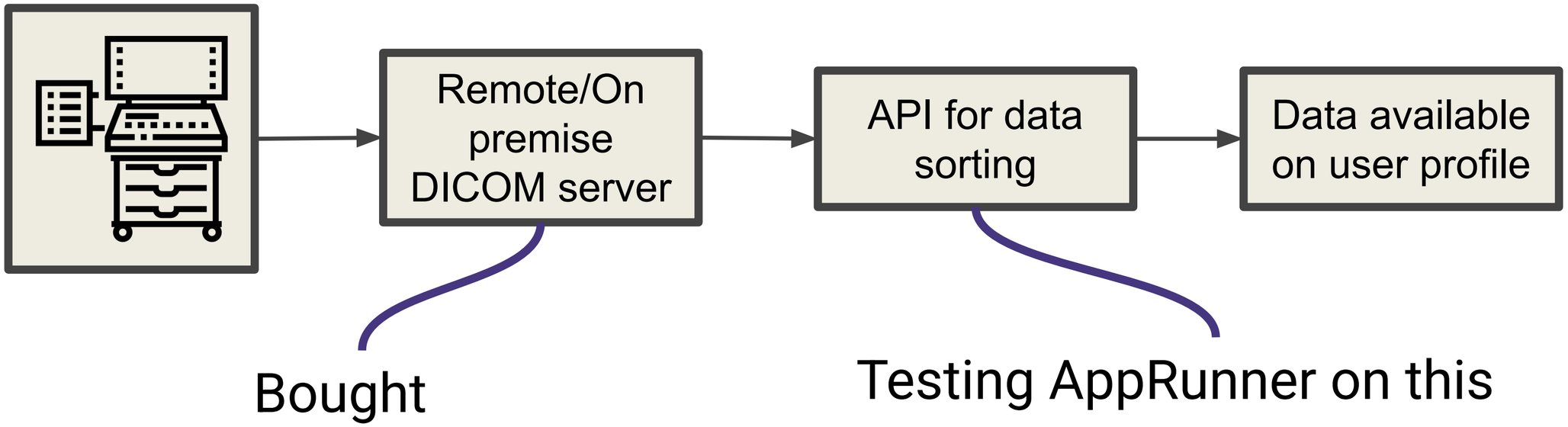
Buy vs build: dealing with media files

- New needs: larger imports, new data format
- Buying often provides predictable pricing models with scalable options
- Building requires ongoing maintenance, updates, and infrastructure investment

Fully managed: AWS HealthImaging, AWS Elemental MediaConvert

Deployment in clinical environment

- Not core
- Crucial for time to market and customer retention



What viable solutions have in common

Containerization:

whatever the tool, we deploy

Standardization:

dicom in vs dicom out