

# Machine learning productization in Azure

Products of Axora

JUNE 2023



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01

# Basic Use-Case and POC

The use-case to solve (originally)

## BASIC USE-CASE AND COMPLICATIONS

## Basic Use-Case

Rocks are extracted and crushed into:

- rocks that we like
- rocks that we don't like
- other things with various effects

Let's support this person with CV and ML based auto-detection



*Contaminant removal*



Results of crushing coming out



on a **Conveyor belt**



*operator*

Standard sized ore rocks only



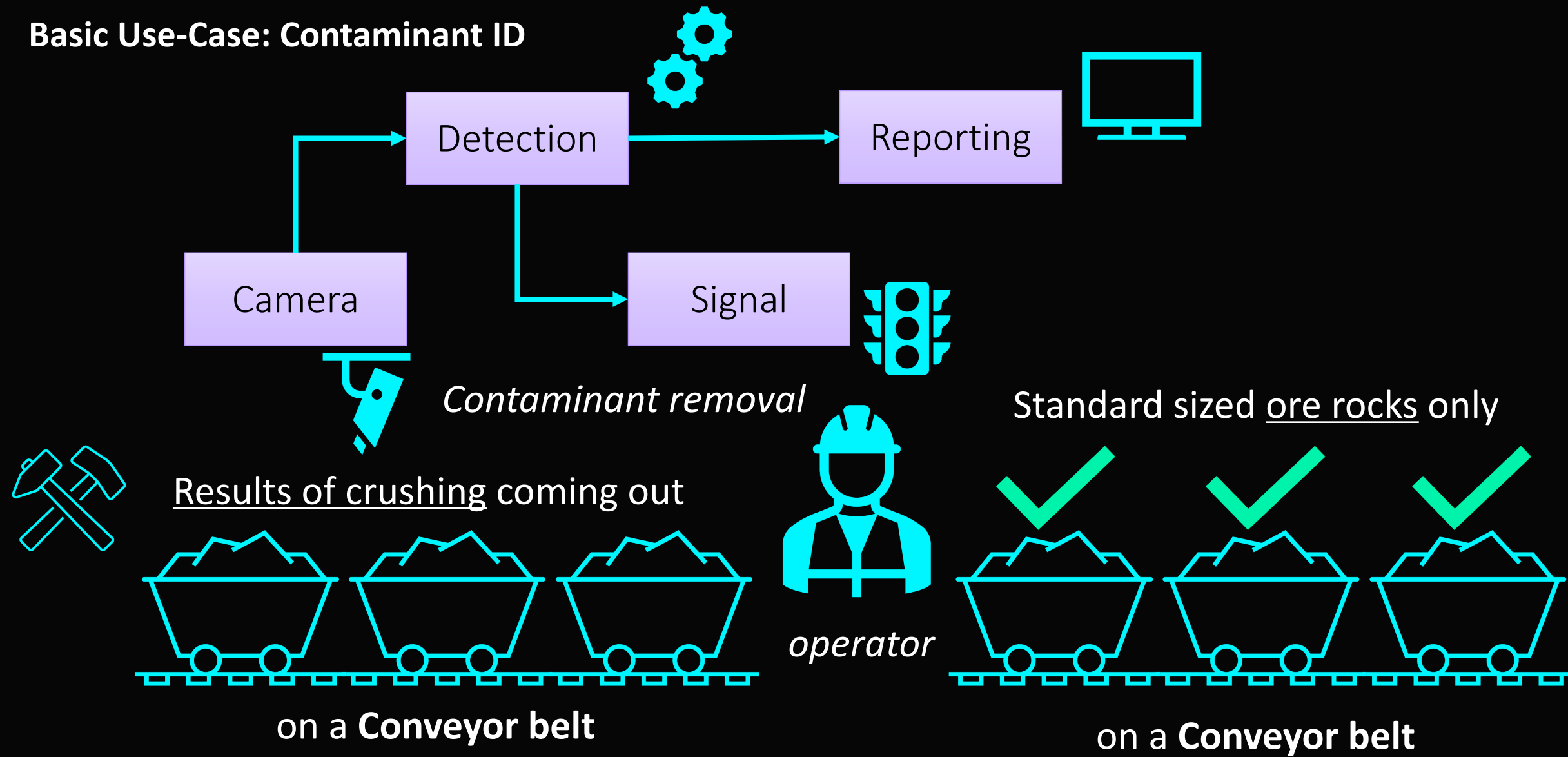
on a **Conveyor belt**

02

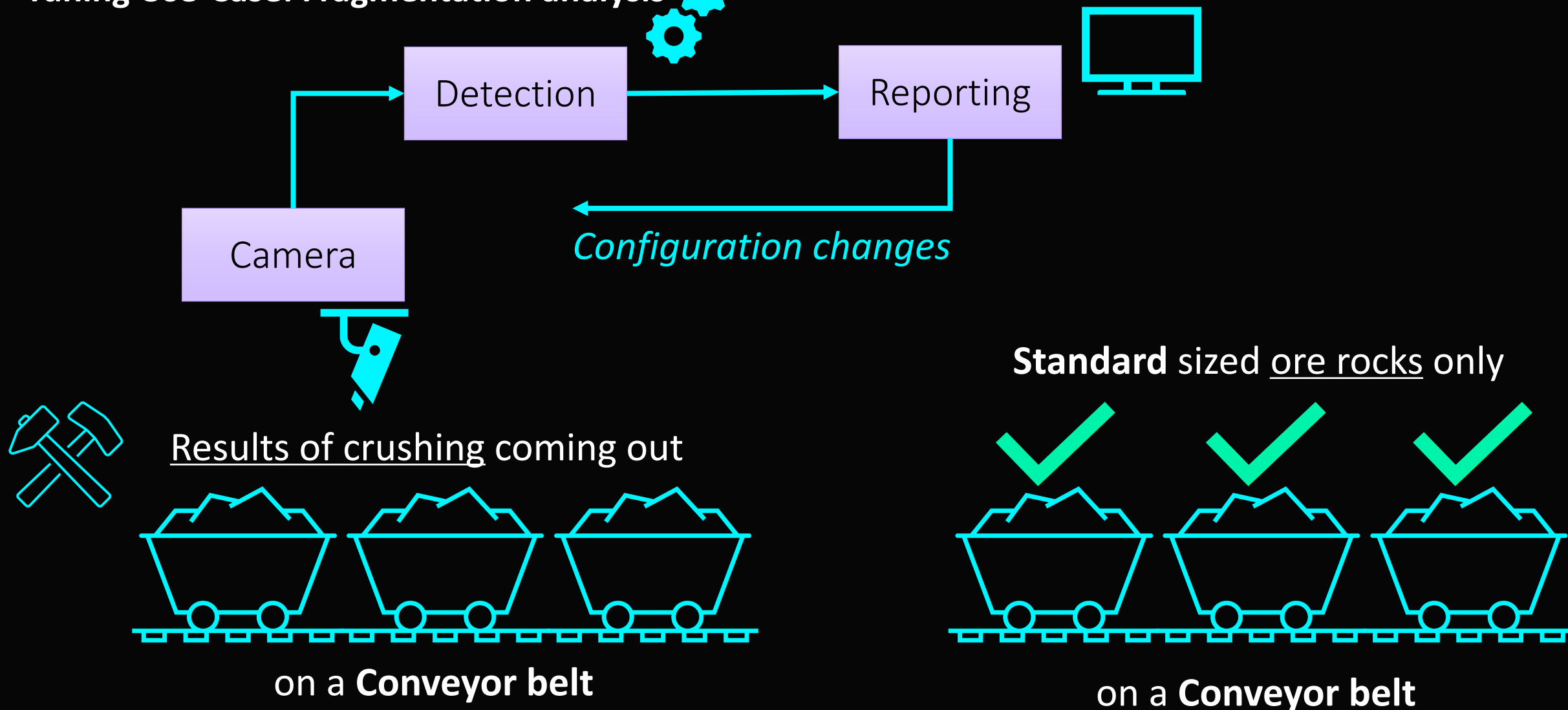
# Business Products

Use-case specifics

Basic Use-Case: Contaminant ID



## Tuning Use-Case: Fragmentation analysis



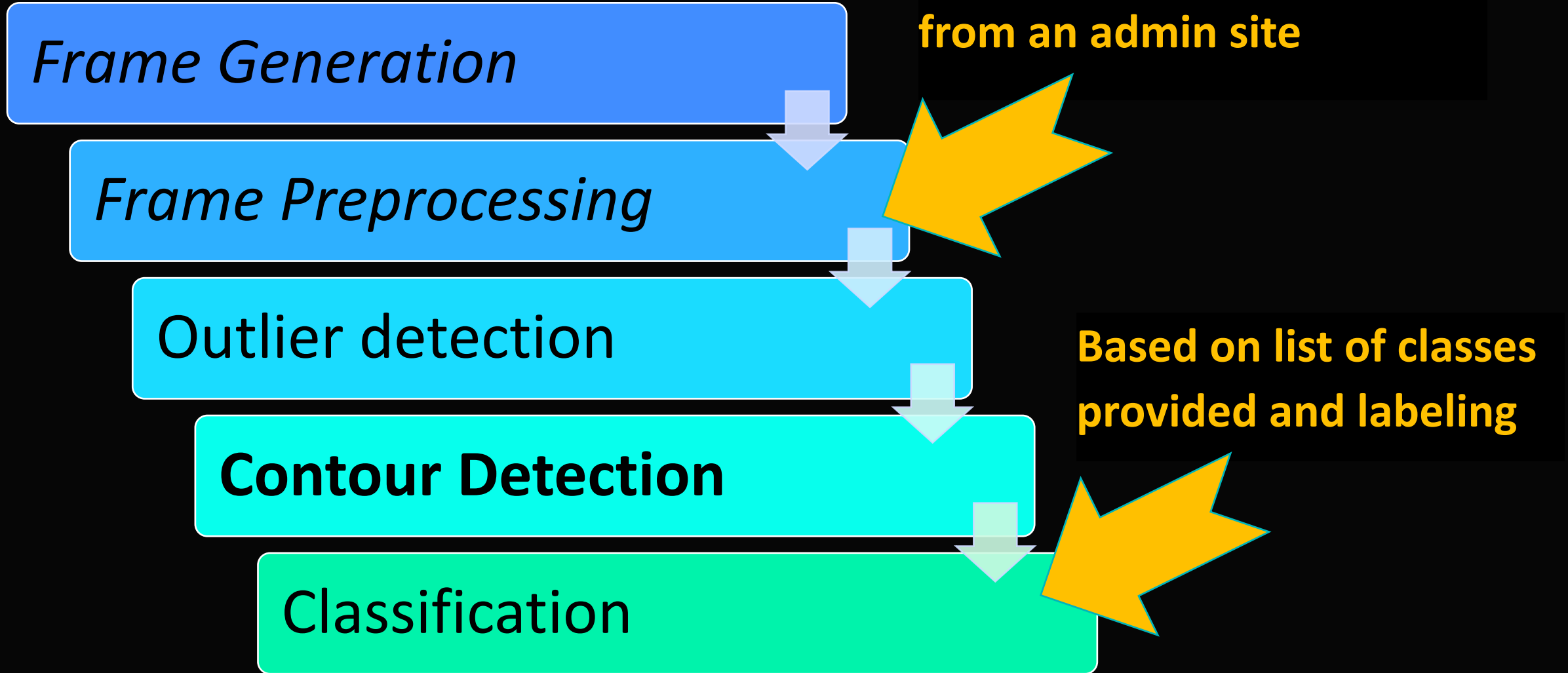
03

# ML design

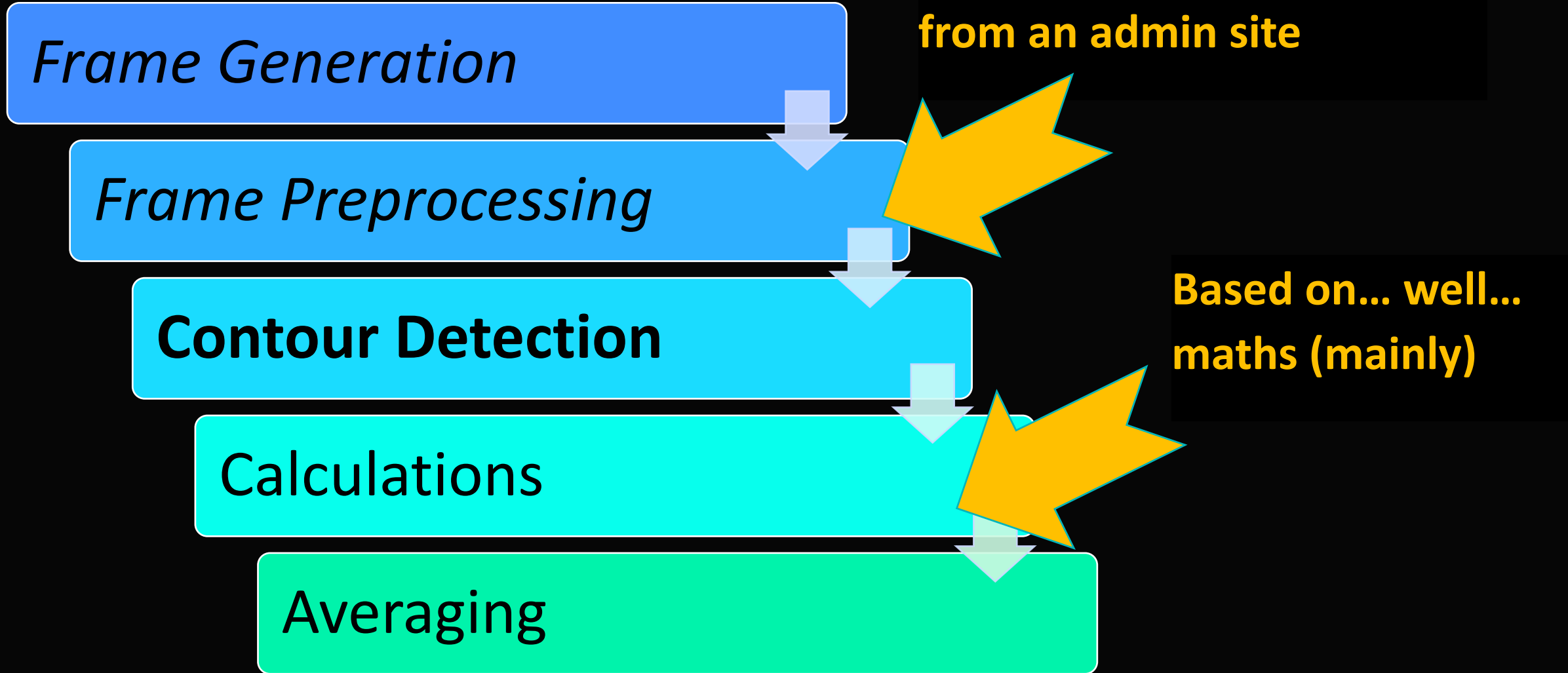
Machine Learning details  
(without disclosing the algorithms themselves)



## Machine Learning design (Contaminant ID)



## Machine Learning design (Fragmentation Analysis)



04

# Component design

Microservice architecture

## Pain Points and Complications

### Amounts of data required

Cameras could be set up similarly, but still, the material in question will be very different for each.

To properly study the generalisation power and opportunities.

### POC for independent sites only

POC design was only considering one independent deployment, no shared information between plants and/or Axora.

### War in Ukraine and implications

The war in Ukraine caused some real complications for both Axora and EPAM.

Axora's test bed and original data were in/from Russian mines.

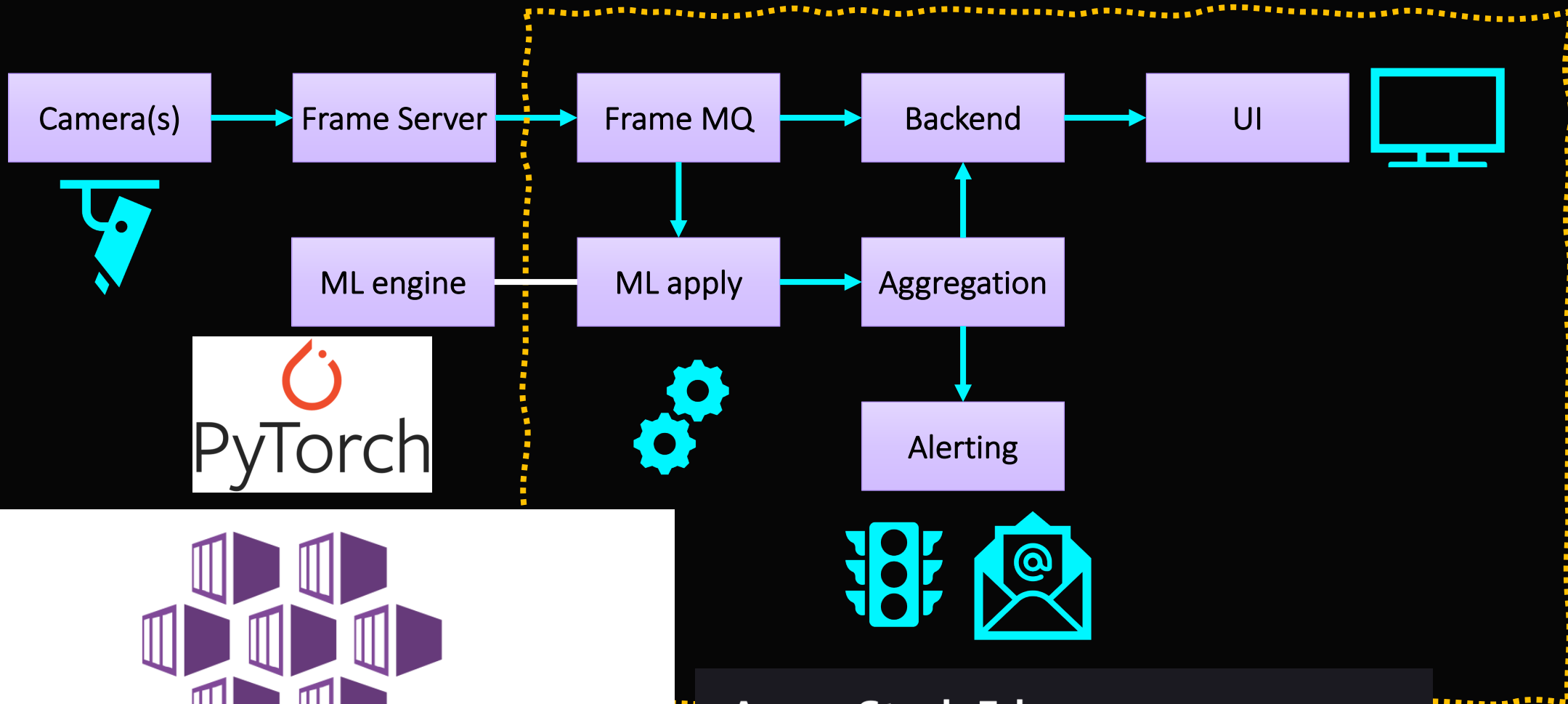
Many EPAMers from Russian office (which got closed).

### New customer, new use-case

The new primer customer was looking for an analytical system instead of a detection system.



## Component design (single site)

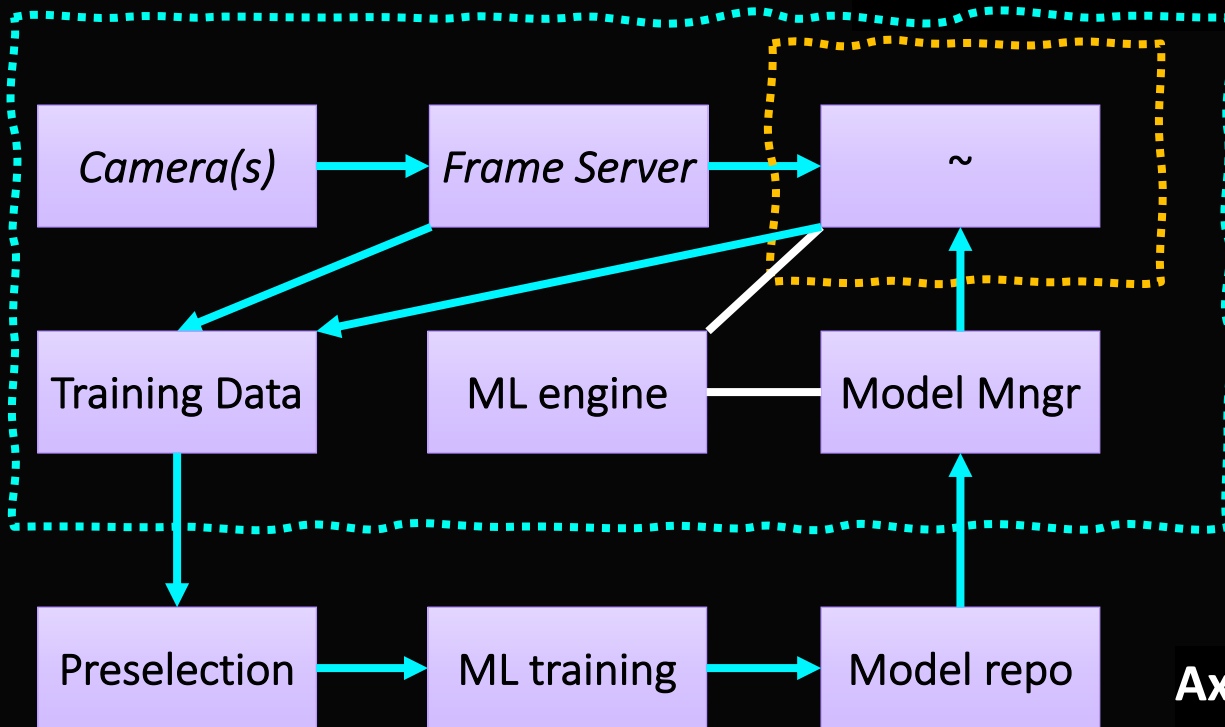


**Azure Kubernetes Service (AKS)**

## Azure Stack Edge

An Azure managed device that brings the compute, storage, and intelligence of Azure to the edge.

## Component design (multi-site)

Can be replicated  
in cloudAzure Stack Edge  
device with GPUAxora Cloud  
Account



# Disclaimer

A special thanks to Axora for the chance to work together on these interesting products and letting us do this presentation about it.

Contact: [ally.gale@axora.com](mailto:ally.gale@axora.com) for sharing permissions.

# Thank you!

For more information, contact

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