The Advantech partner ecosystem strategy
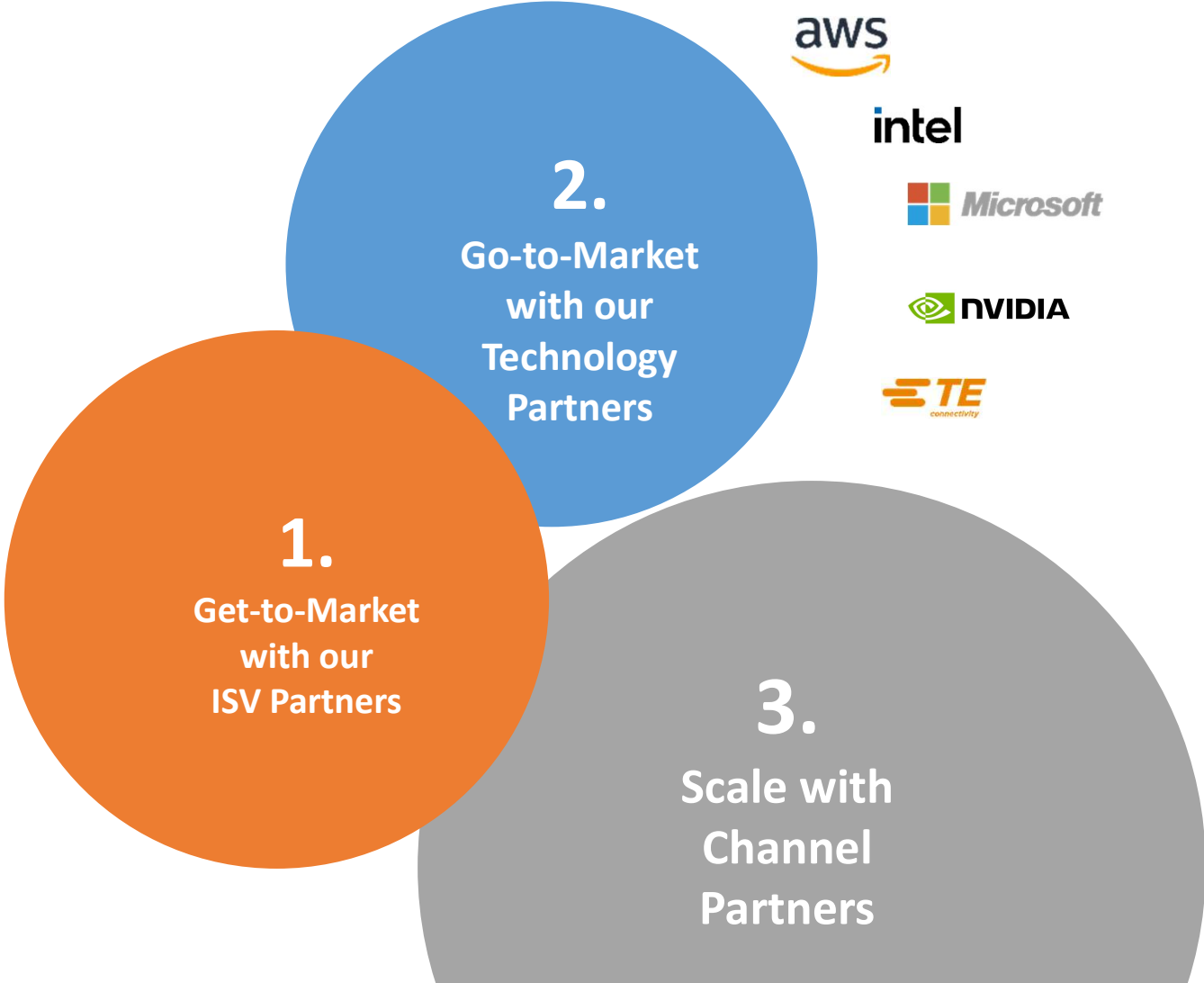
Uncover the blind sides of your machines, discover new areas of untapped profit.

How Advantech & Captic can help you make future-proof machines... TODAY.

ADVANTECH **CAPTIC**

What did your mom tell you?

PLEASE DON'T...

Get into strangers' cars

Sleep at strangers' places

CAPTIC

What are we doing?

CAPTIC

So why do we trust these strangers?
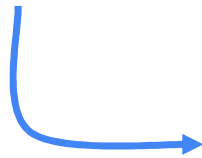
*Humans are **data-driven!***

Cliché:

DATA IS THE NEW GOLD!

CAPTIC

What do we notice...

Most companies do not have a clear **DATA STRATEGY** yet.
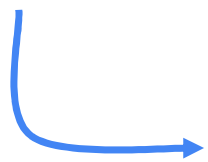
↳ _Including **Machine Builders**_

CAPTIC

What data is already being collected?

Vibration

Temperature

Humidity

Speed

Volumes

PH

Quality

Accurate numbers

Issues

Process Monitoring

Coordinates

...

TRADITIONAL SENSORS → Trends

True insights & complex handling of products ← **OPERATOR**

CAPTIC

The current challenge many companies are facing?

THE OPERATOR

- Increasing wage costs

- Constant recruiting effort

- Ageing workforce = lost experience

- Constant planning effort

- Hard to provide meaningful work

*Huge opportunity for **Machine Builders***

CAPTIC

What if...

you could deliver machines with an operator built in that could:

- Work 3 shifts a day
- Sees every little detail
- Never gets sick
- Never retires, so no lost knowledge

While:

- Increasing capacity & quality
- Gaining precise insights
- Reducing waste
- Improving over time

For a fraction of the current labor cost

→ **You would be very hard to compete with**
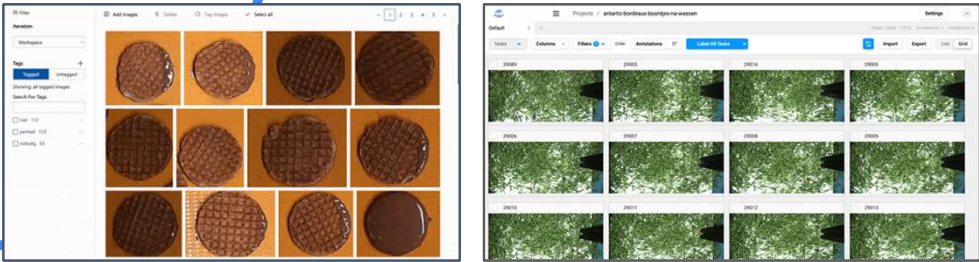
Captic built a modular AI-Vision system.

Your Machine.

We pick a camera module:

- RGB Area
- 3D
- Line Scan
- Other spectra

We leverage our unified AI core.

- Data Collection
- Labeling
- (Re)-training
- Go live

We pick an automation module:

- PLCs
- Robotics
- Code
- ...

We pick an insights module:

- Dashboards
- Datalake
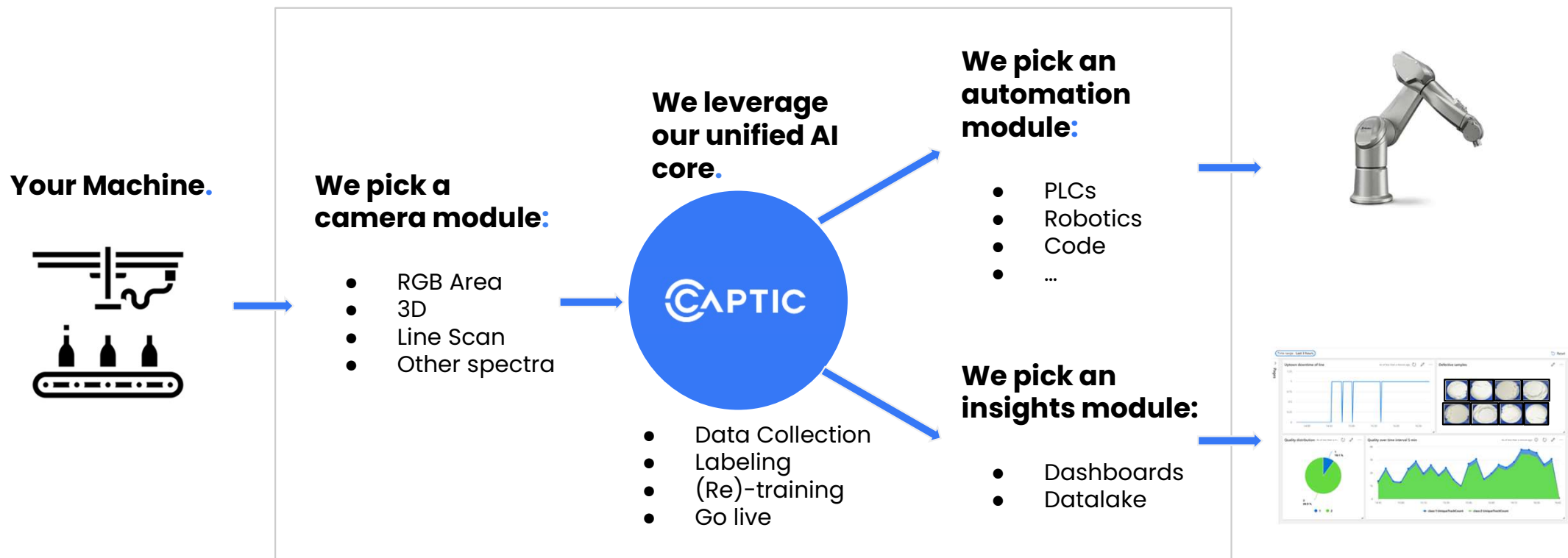
Captic brings the value of AI-Vision to manufacturing, today.
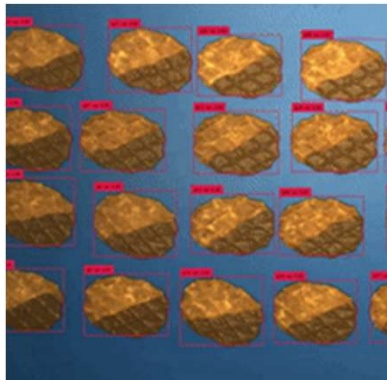
Automated quality control
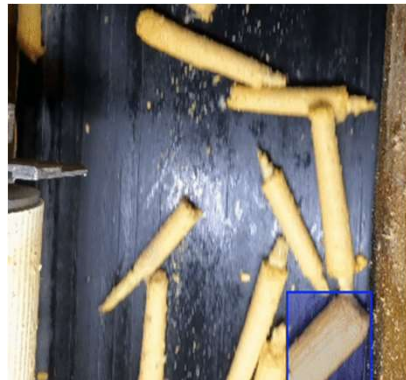
Waste stream analysis

Smart label Inspection

Vision guided robotics

Proven to work:

Belgian Pork Group   GREENYARD   JULES DESTROOPER   WHAT'S COOKING?   ANTARCTIC FOODS   Anna Faggio   ELECTROTECHNIEK DECALF.

13

Hype will pass and **substance will last**

Cloud

Big Data

AI & IoT

Digital Twin

Gen AI

2012

2015

2018

2020

2023

ML6

ML6 started investing in vision AI

CAPTIC

Captic continuous to productize vision AI
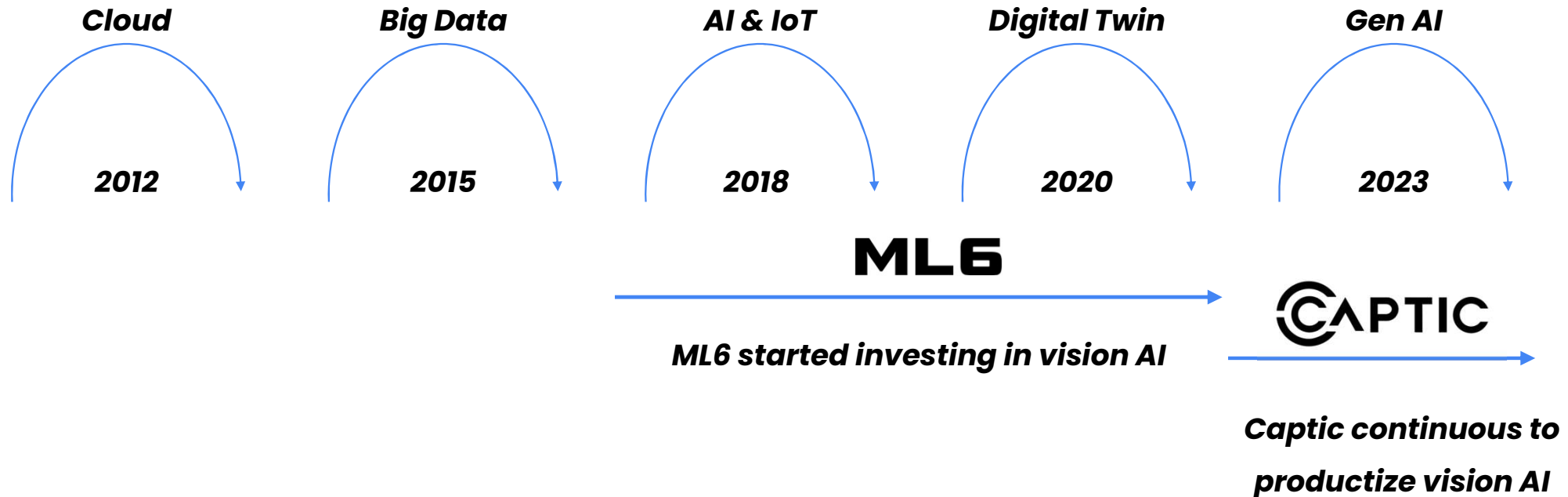
Captic's leveraging early investments.

*Allowing us to be **your fast track to smart machines***

CAPTIC

Timing is essential.

Too early = **Limited value**

TODAY

Too late = **Lost leadership**

THE MOMENT TO DISRUPT IS NOW!

CAPTIC

Timing is essential.

BUT THE MOMENT OF BEING DISRUPTED **IS ALSO NOW!**
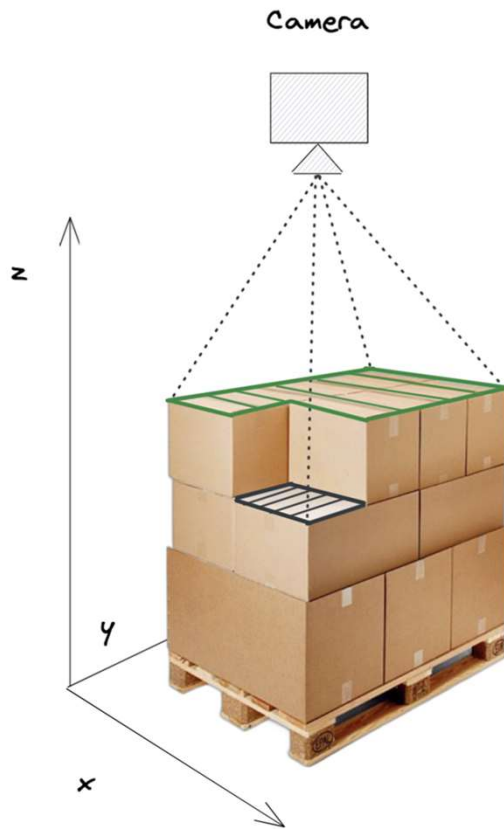
CAPTIC

USE-CASES.

The fast track to tomorrow's machines.

Advanced pallet unloading.

How 2D & 3D vision are used by Captic & Elektro Decalf to build a very powerful depalletizing solution.
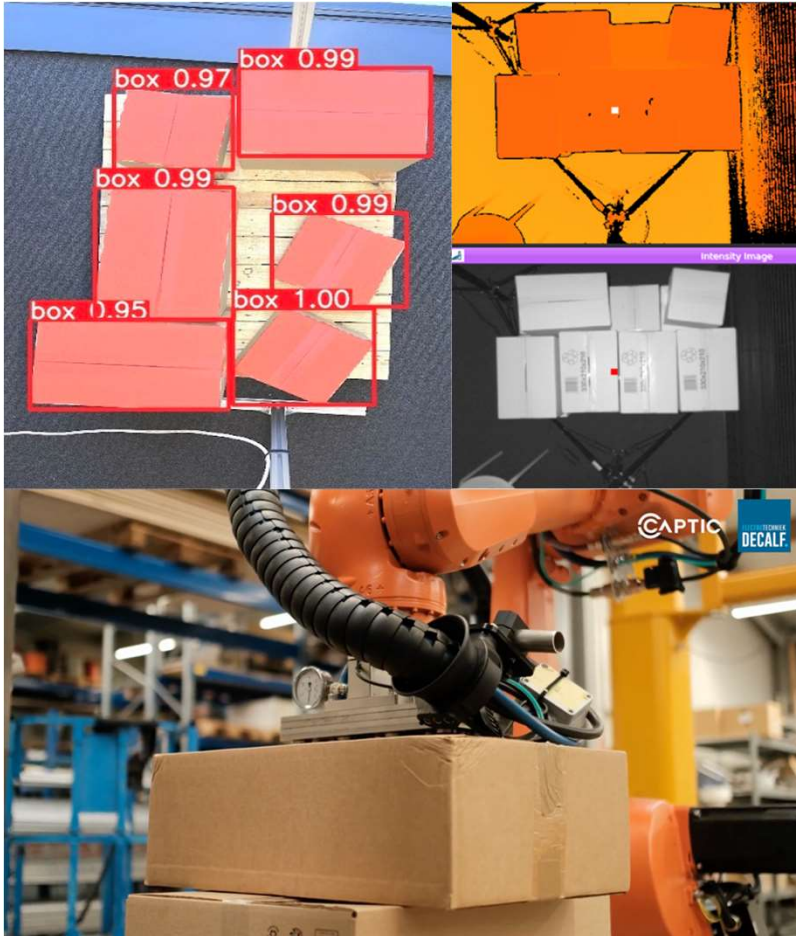
CAPTIC

The challenge.

Elektro Decalf, A Belgian automation specialist, was looking for a vision solution that could help them depalletise a pallet with random cardboard boxes containing frozen products.

Difficulties:

- Many different box types
- Orientation of squared boxes
- Damaged boxes
- Rotation / angles at which the boxes need to be taken
- Hygienic design → Installed in a high-care zone.

Next to the cardboard box, the solution is also able to deal with other relevant objects.

The solution.

Using a combination of 2D and 3D vision, Captic is able to identify all boxes on a pallet and provide the accurate coordinates of the next box to pick.

In a later stage, the same vision solution is being used to remove the cardboard box and typical blue "food-grade" liner.

Outcome.

This single solution is replacing 4 operators / shift. With two shifts a day, and thanks to the consistent output, this solution has an ROI of less than 2 years.

In real life.
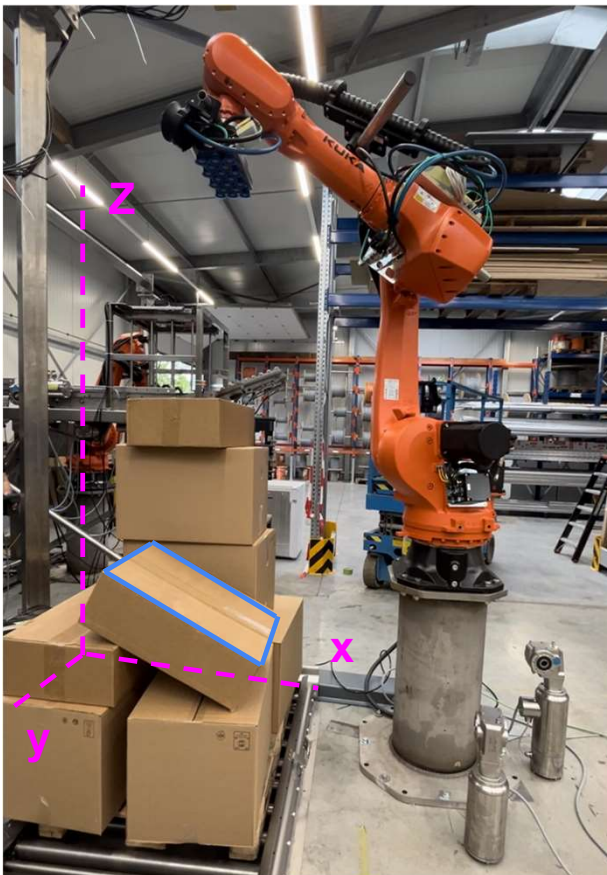
The hardware used.

High-level architecture

1. PLC sends trigger to both cameras

2. The image as well as the point-cloud are being sent to the IPC

3. The IPC analyses the images using AI and sends the coordinates to the PLC

MODBUS/TCP

PLC

Advantech

Ethernet/IP

KUKA

The image analysis flow.

2D image

AI – Segmentation

3D point cloud

Mapping 2D & 3D

Logic:

- **Green**: Next Box
- **Purple**: Other boxes
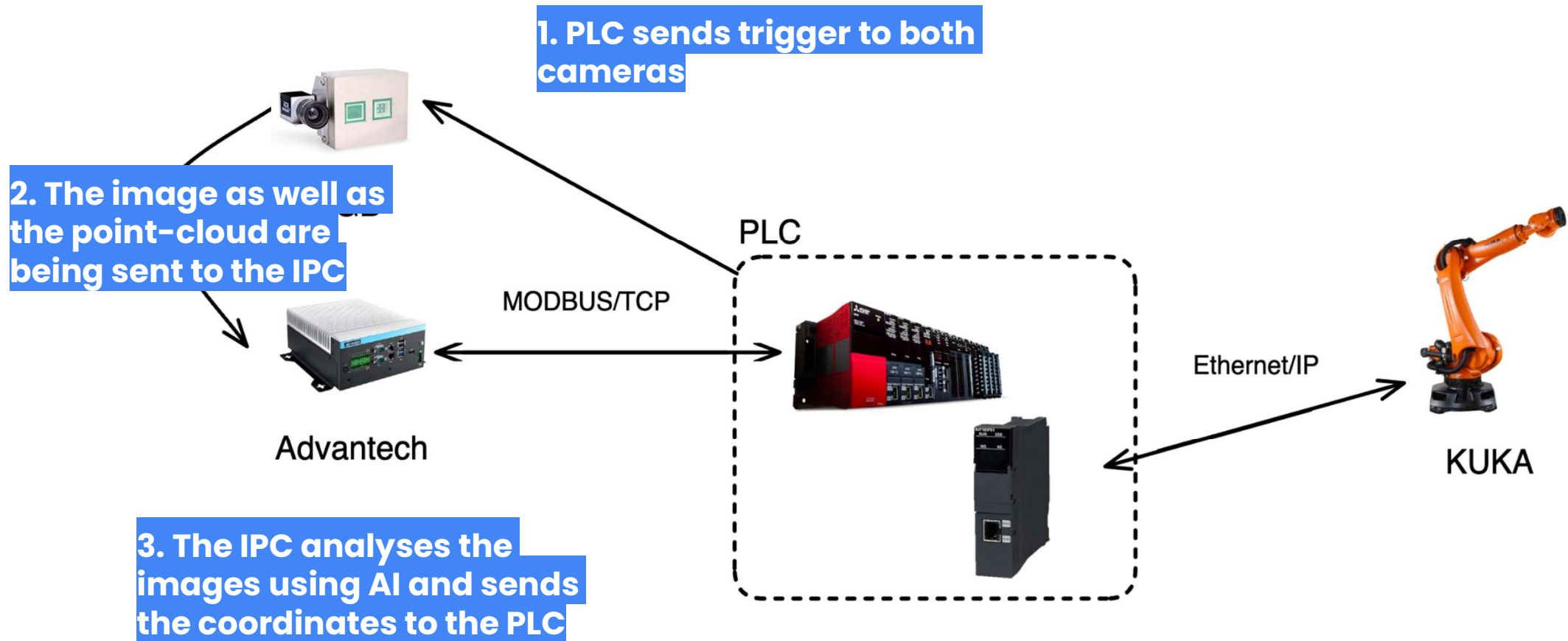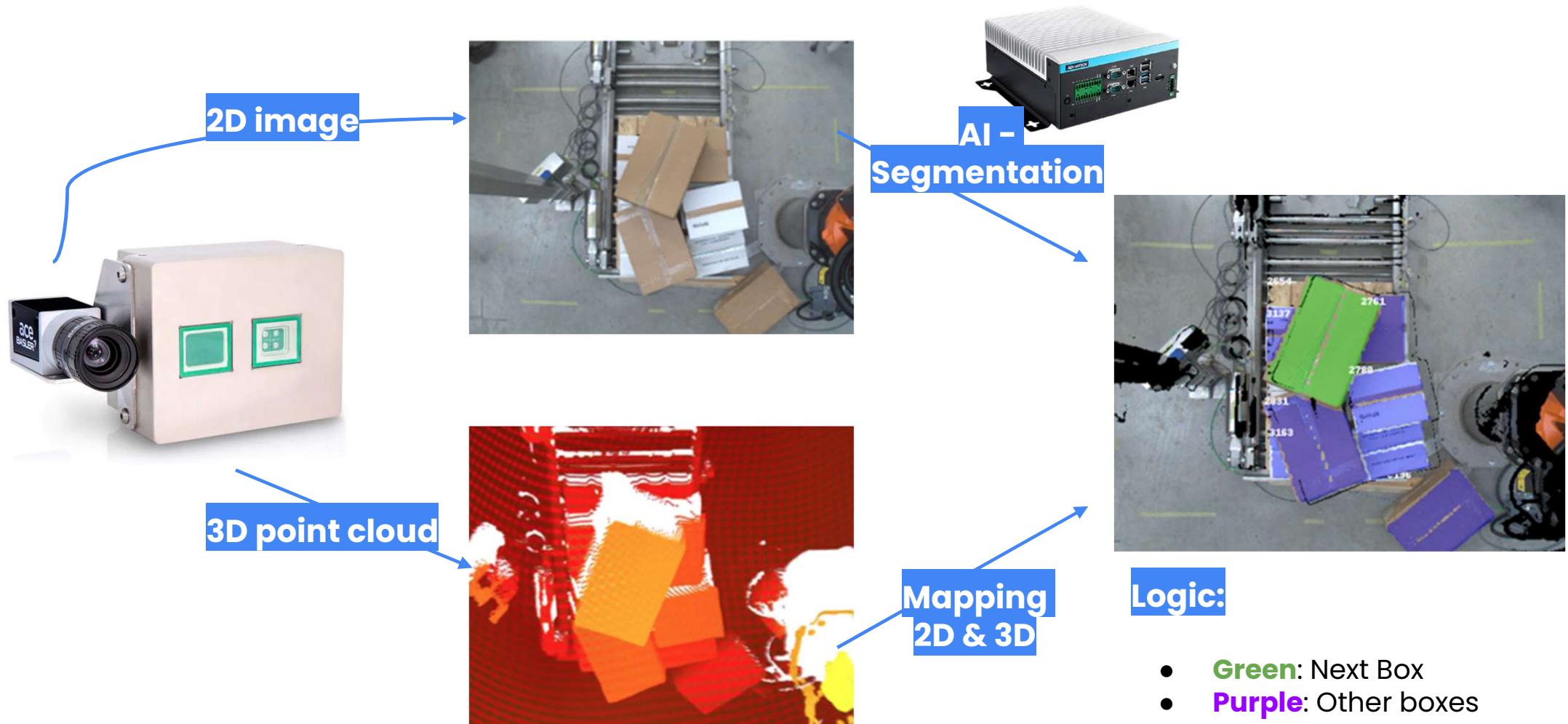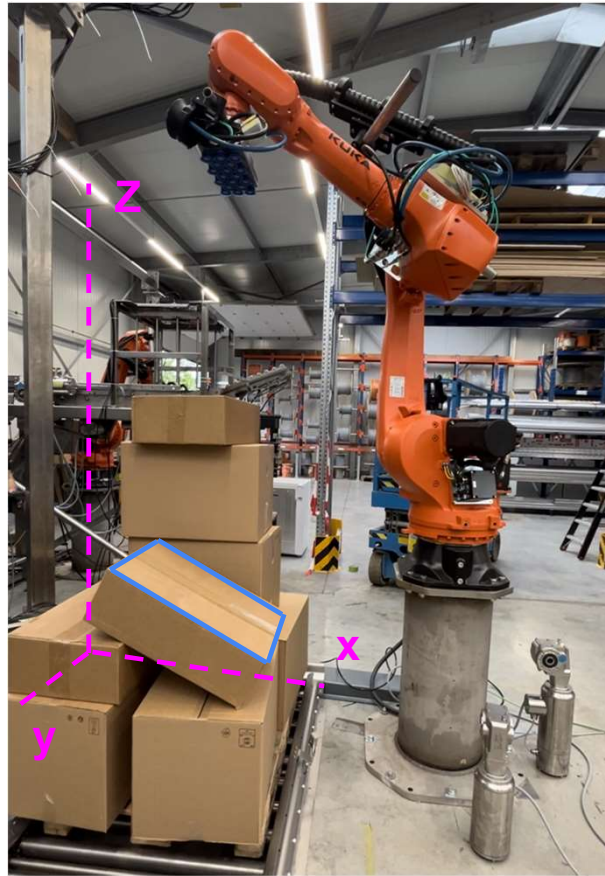
Robot - vision calibration.

The main difficulty

Determine correct pickup point and orientation

- x, y, z
- c, b, a (Angles)

The working solution.

Inline removal of defective cookies

How an existing production line was retrofitted with a camera system and breaker to **save out 2 FTEs each shift**

CAPTIC

The challenge.

Jules Destrooper, a producer of premium biscuits, is known for its quality. Therefore, they only want to sell biscuits that meet their most stringent quality standards. They've recently introduced a new biscuit that's hard to produce, so they only allow cookies that meet their standards, i.e. the chocolate follows the centre diagonal perfectly.

Difficulties:

- Different types of chocolates
- Small and large variant of the biscuit
- Orientation of the biscuits changes
- They want insights into the type of defect
- Connection with a breaking mechanism

In the future, the solution needs to be able to deal with other biscuits / defects as well.

BESTE PRODUCT
VAN HET JAAR

MEILLEUR PRODUIT
DE L'ANNÉE

2022 - 2023

The solution.

By installing a 2D camera above the existing line, Captic is able to identify all defective biscuits on the conveyor and sent the accurate coordinates to the breaker.

Outcome.

This single solution is replacing 2 operators / shift. With two shifts a day, and thanks to the consistent output, this solution has an ROI of less than 1 year. Furthermore, the vision system is also being used to improve the efficiency of the process, drastically reducing waste.

Solution flow.
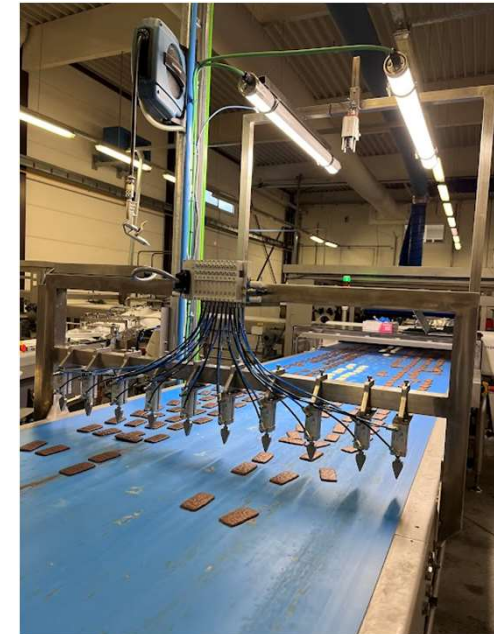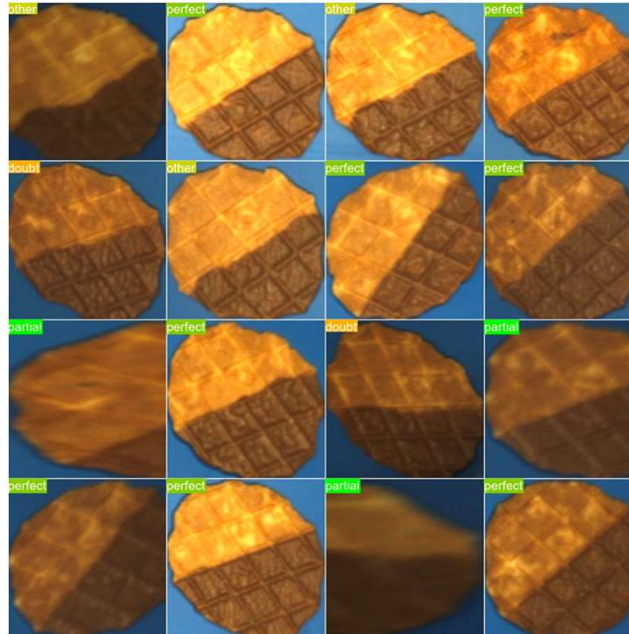
DETECTION → **CLASSIFICATION** → **ACT**

Improved vegetable processing efficiency

How **multiple cameras drastically improved the overall efficiency** of a sweet corn processing line.

CAPTIC

The challenge.

Antarctic Foods, an industrial processor of frozen vegetables, is well known for its Sweet Corn. However as prices are going up and trained operators are harder and harder to find, Antarctic Foods was looking for a smart solution to optimize their sweet corn processing line.

Difficulties:

- Multi-step process
- Different things to detect
- Taking action when something is being detected

In the future, the solution needs to be able to deal with other biscuits / defects as well.

Sweetcorn production flow.

RECEPTION / DE-LEAFING   **CUTTING/CLEANING**   **BLANCHING & FREEZING**   **PACKAGING**

Reception — Deleafing — Manual inspection — Cutting — Cleaning — Blanching — Freezing — Octabin packaging — Optical sorting — Waste — To warehouse
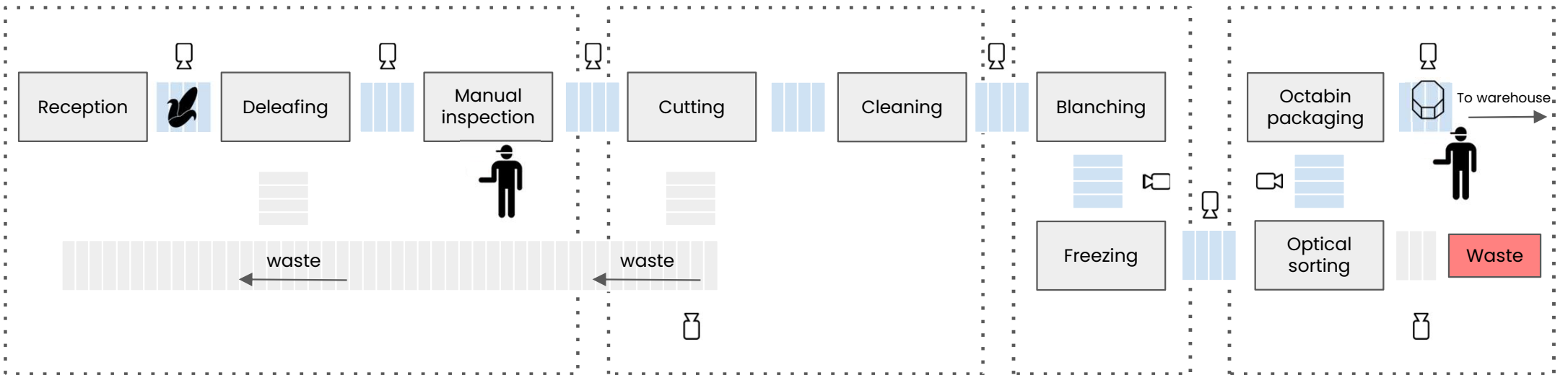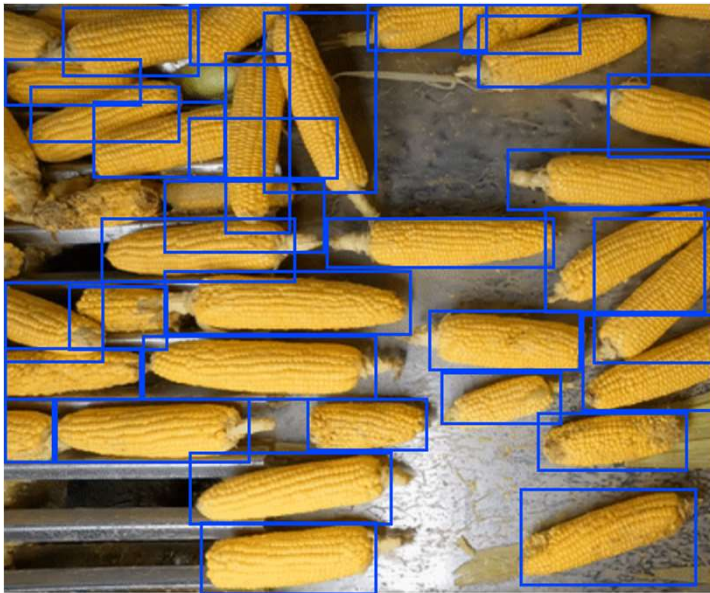
waste

waste

3 setups = optimized flow.

CORN RECEPTION:
1. Overall quality assessment
2. Volume estimate

WASTE CONVEYOR
1. De-husking efficiency

FINAL OPTICAL SORTING
1. QUALITY GRADING
2. ANOMALY DETECTION

The solution.

3 setups throughout the process.

Outcome.

Better quality grading, automatic detection of anomalies, real time fine-tuning of the cutting machines as well as automatic reception selection on the optical sorters.

The system drastically reduced the quality complaints as well as improved the overall efficiency.

The system is now being rolled out on other lines as well.

Closing remarks.

The time is now?

The value of data can't be underestimated.

CAPTIC

+

Historic visual data

- Production numbers
- Downtime / uptime
- Quality and specific defects
- Accurate coordinates
- Issues
- …

Historic machine / process data
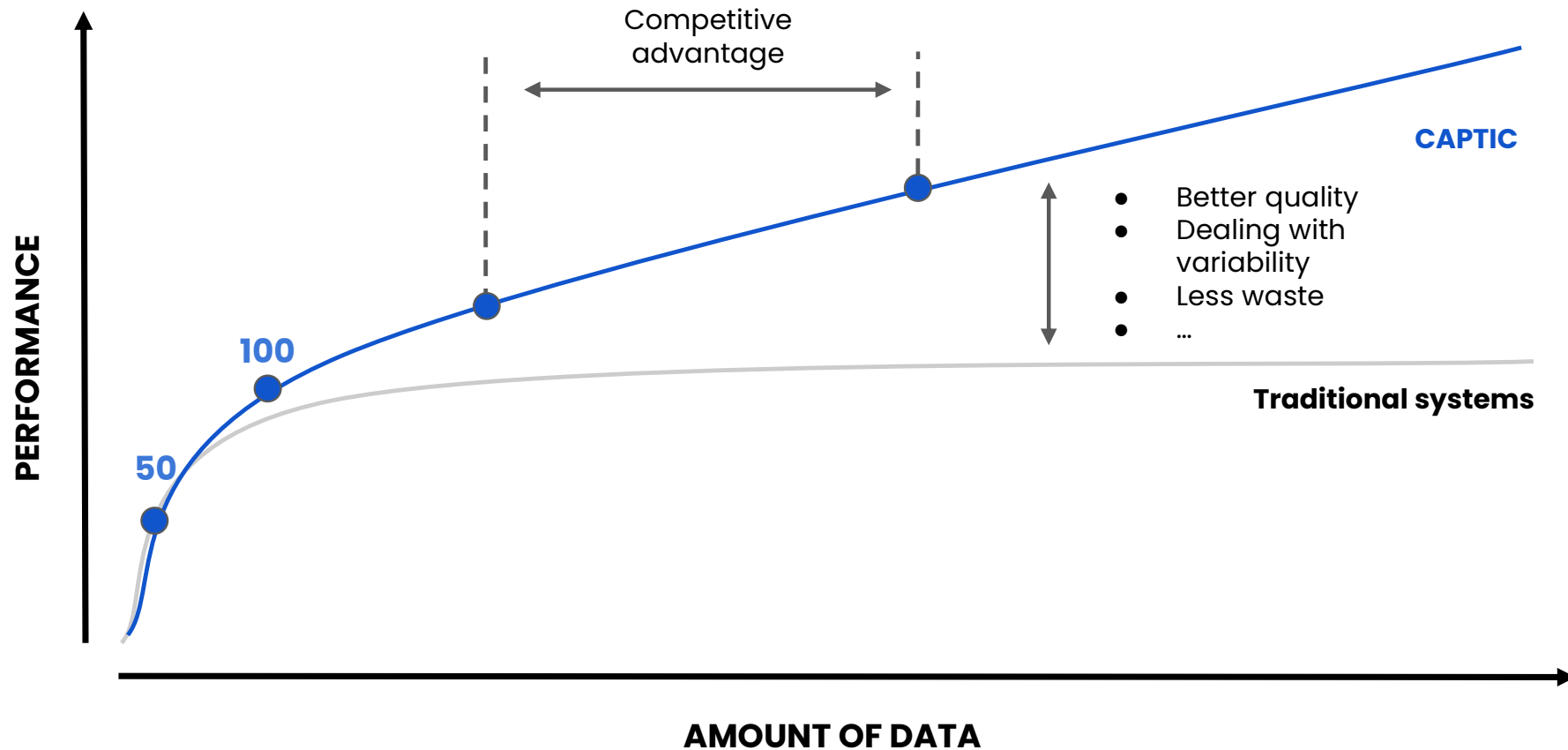
- Line speed
- Vibration
- Humidity
- Temperature
- …

MACHINES OF THE FUTURE!

Proactive steering of machines / entire lines

→

- **Higher efficiency**
- **Less waste**
- **Less downtime**

CAPTIC

The sooner you start, the higher the value.

PERFORMANCE

Competitive advantage

CAPTIC

50

100

- Better quality
- Dealing with variability
- Less waste
- ...

Traditional systems

AMOUNT OF DATA

CAPTIC

TIME TO CHALLENGE
THE STATUS QUO!

CAPTIC

Gert-Jan

Inspired?

We'd love to talk to you at our booth!

Gert-Jan.

Jim.

Jonathan.

CAPTIC

ADVANTECH

Marinho.

40

Thank you!

Jonathan.kesteloot@captic.com
Jim.tenbroeke@advantech.nl

The building blocks.

CLASSIFICATION

OBJECT DETECTION

SEGMENTATION

SLICED SALAMI

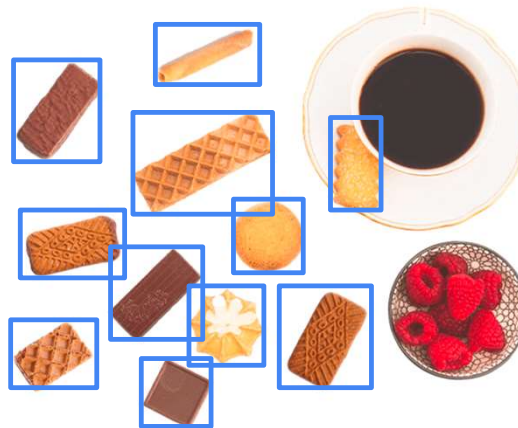**54% Chocolate**

- A general statement on a picture e.g. salami vs. ham, undercooked vs. overcooked tortilla, or OK vs. NOK, type of bread
- Very powerful for a wide range of applications
- Fast labeling

- Identify individual objects within a picture
- Get exact coordinates of these objects
- Can be used for counting, automation, inspection, …
- Labor intensive labeling

- Follow the exact contours of an object or object feature.
- Can be used to get very detailed information, e.g. exact size, …
- Very labor-intensive to get everything labeled with polygons

CAPTIC

The building blocks.

OCR

FROZEN
GREEN
PEAS

- 3d vectors can be derived from post-processing bounding boxes / segmentation masks.
- Vectors provide information about the positioning of an object and are very useful to guide a robot towards an object or specific object feature..

- OCR is used to read translate an image into text
- OCR is often being used in combination with object detection to identify the position of a label / barcode and then to read what is written on the label / read the barcode

CAPTIC