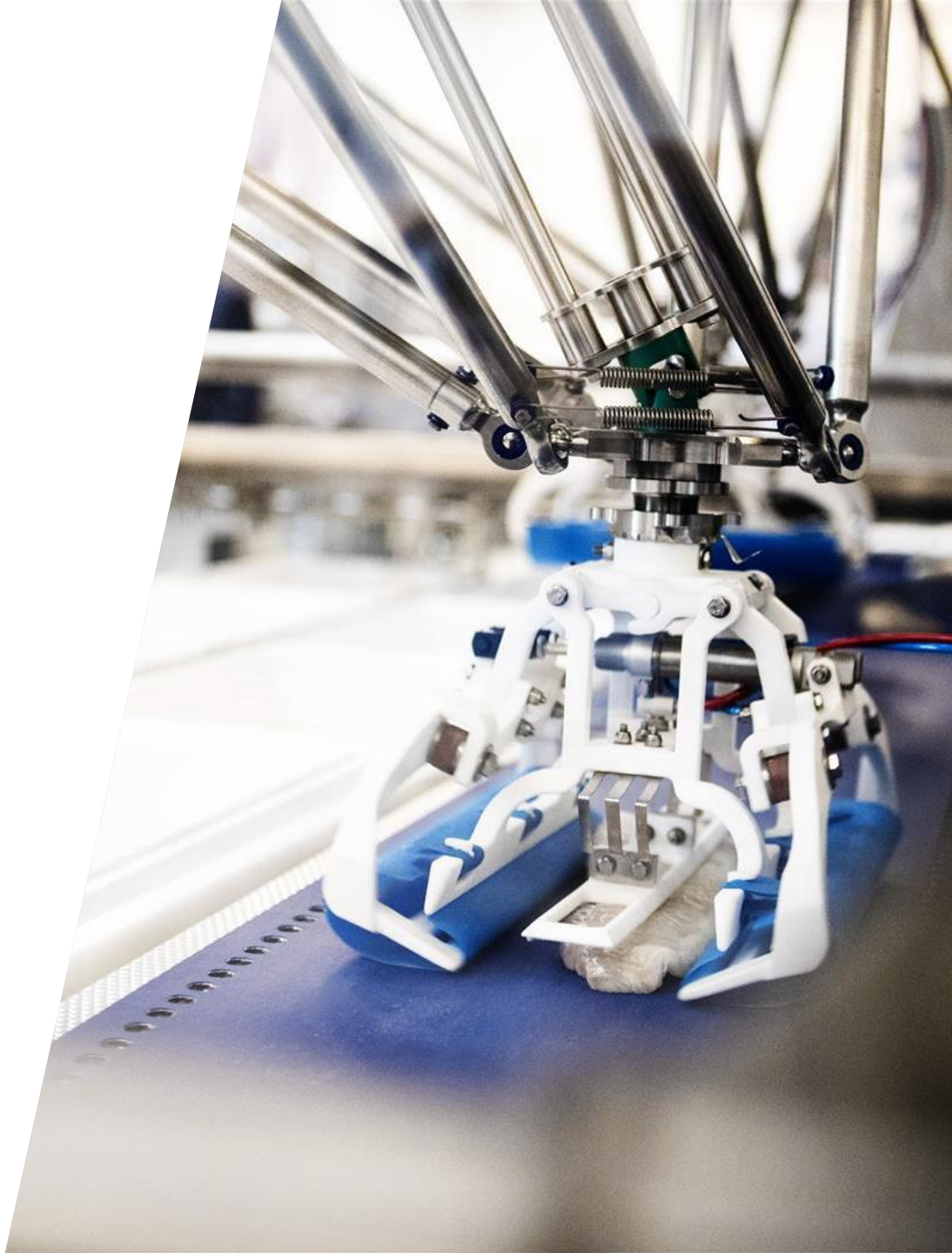
New Technology for Onboard Production



Sigurður Ólason, *EVP Marel FISH*

January 9th, 2020

ADVANCING FOOD PROCESSING

Marel at a glance

Marel is the leading global provider of advanced processing systems and services to the poultry, meat and fish industries

6,000+
EMPLOYEES

30+
COUNTRIES

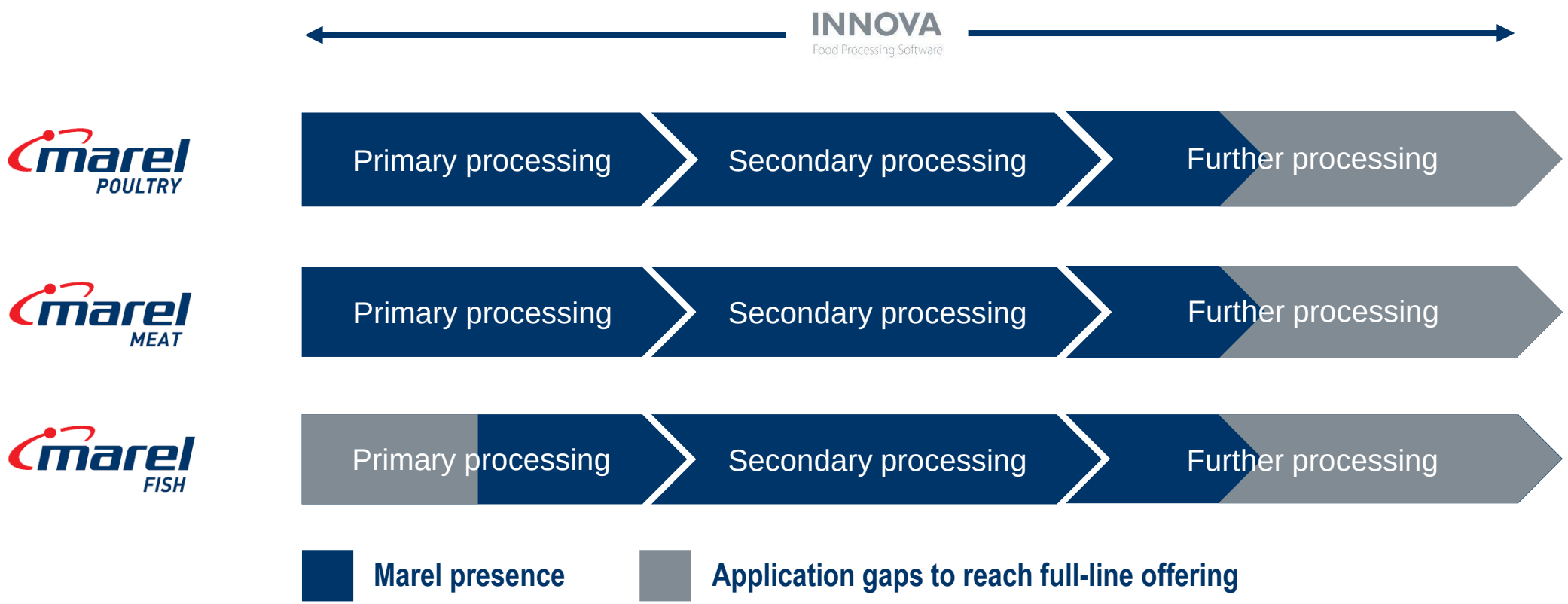
100+
PARTNERS

#1
PROVIDER TO
THE INDUSTRY

€1.2bn
2018
REVENUE

14.6% EBIT
MARGIN
2018

Leading global provider of systems and services



Marel milestones in the fish industry

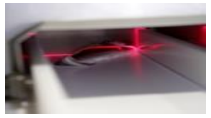
Marel's fish processing systems are designed to increase and maintain the highest quality, throughput and yield possible, leading the way to improved processing efficiency

1983 — Electronic Weighing — Micro Computer Processing

1985 — Electronic Marine Scales

1992 — 1st Generation Flowlines

1993 — Computer Vision Technology



Automatic Grading & Batching

1994 — Automatic Portion Cutters — Marel Software Integrated With Other Systems

1997 — 2nd Generation Flowlines

2000 — Traceability

2003 — X-Ray Technology

2005 — Robot Technology

2006 — 3rd Generation Flowlines

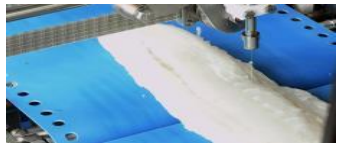
2008 — 5th Generation Software: INNOVA

MS 2730 Salmon Filleter

2011

2013 — Portioning & Robot Loading

2014 — 4th Generation Processing Systems — FleXicut



2016 — FleXisort — Intelligent Product Distribution

2017 — RoboBatcher Flex 3rd Generation Robotics

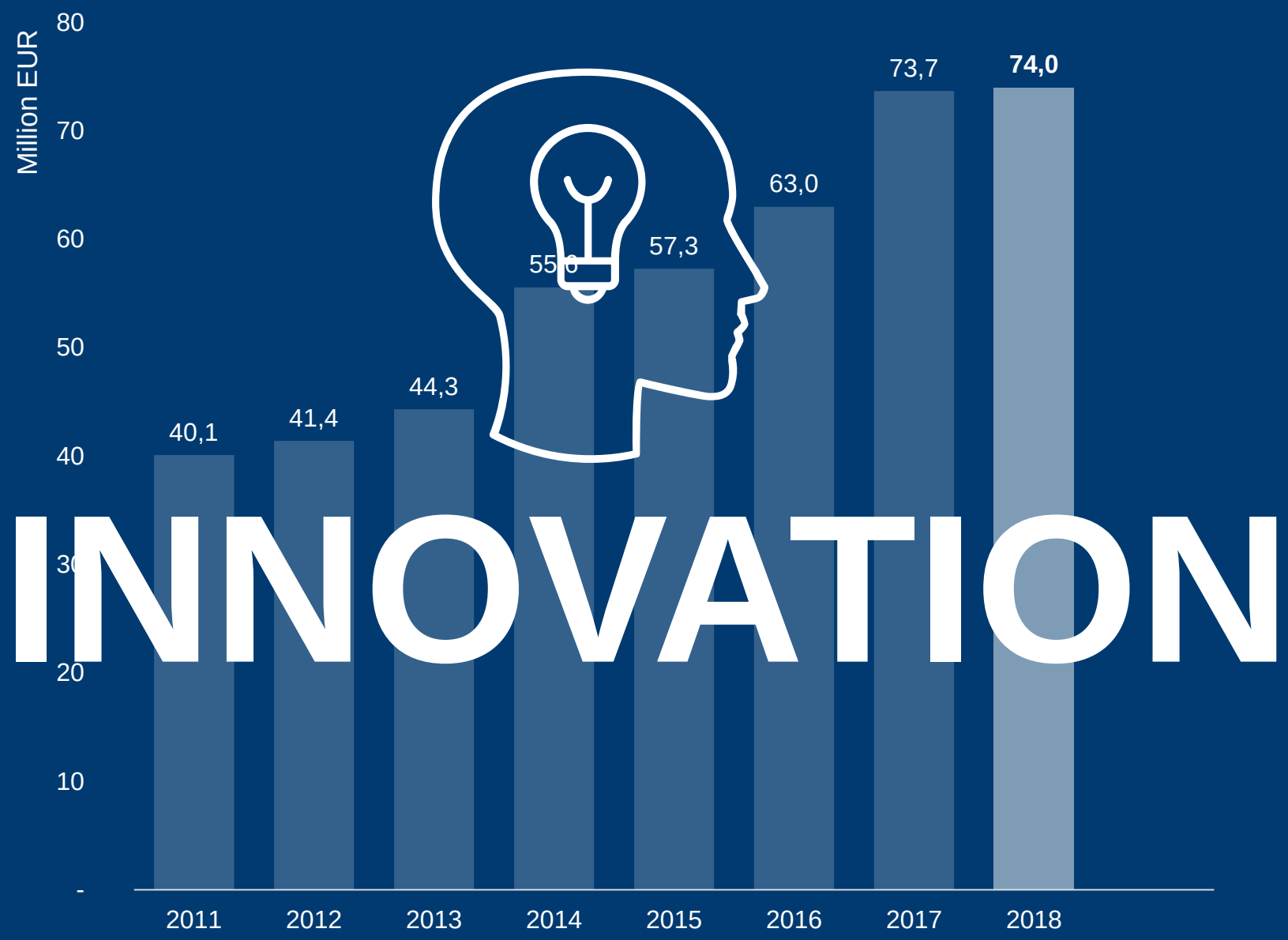
3rd Generation Flowline — Pre-Trim

Vision

*In **partnership** with our customers we are **transforming** the way fish is processed.*

*Our **vision** is of a world where quality food is produced **sustainably** and **affordably**.*

UNITY / **EXCELLENCE** / **INNOVATION**


Million EUR
80
70
60
50
40
30
20
10
-
40,1
41,4
44,3
55,6
57,3
63,0
73,7
74,0
2011
2012
2013
2014
2015
2016
2017
2018
INNOVATION

UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

SUSTAINABILITY

“ MEETING THE NEEDS OF THE PRESENT WITHOUT COMPROMISING THE ABILITY OF FUTURE GENERATIONS TO MEET THEIR OWN NEEDS.“

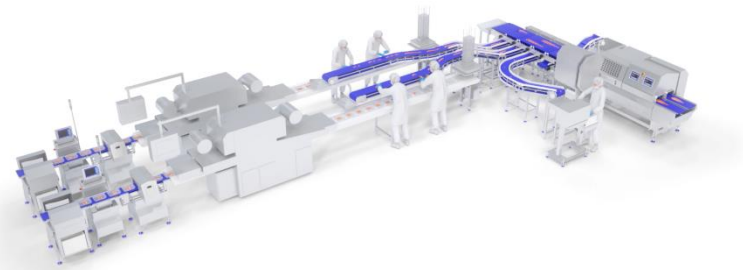
BRUNDTLAND COMMISSION

STANDARD EQUIPMENT

Marel has a strong portfolio of standard equipment and solutions

FULL-LINE SOLUTIONS

Marel delivers advanced processing solutions to the industry ranging from small solutions to full-line greenfield projects



Today’s onboard portfolio

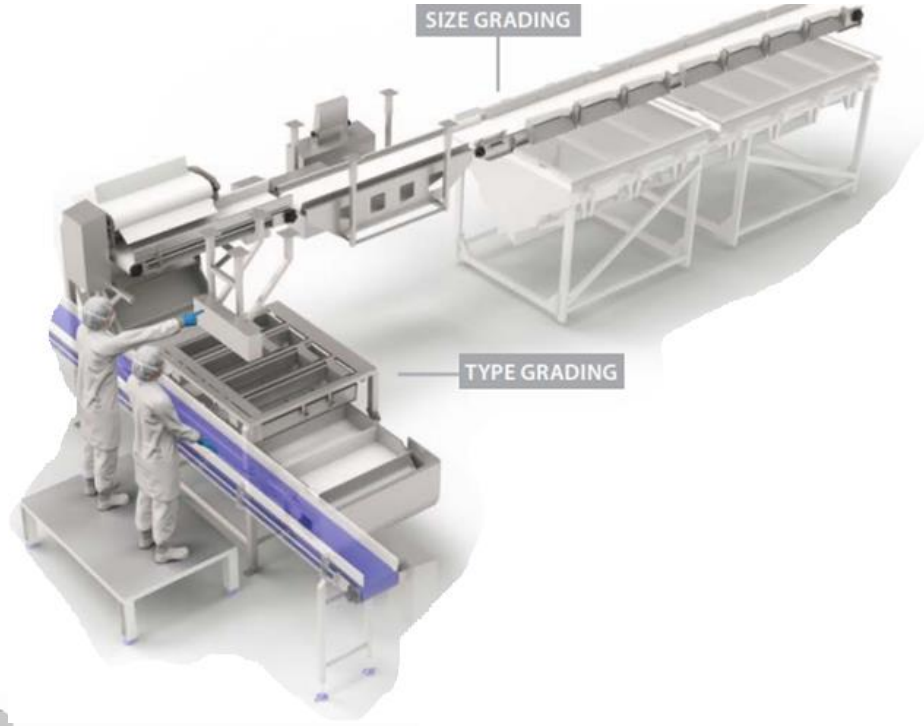
CONTROL

MONITOR

INNOVA

Food Processing Software

IMPROVE



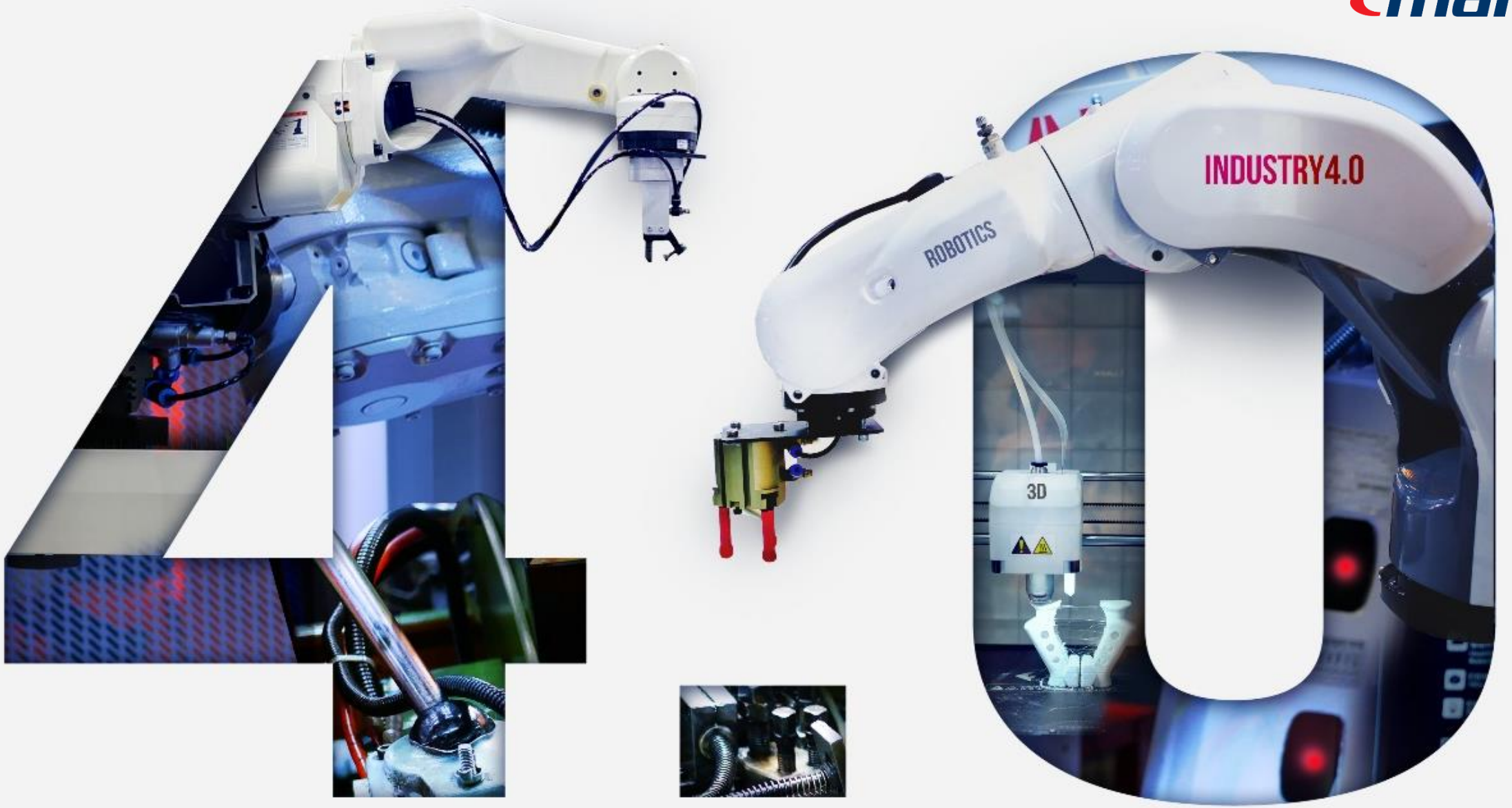
Innova Marine – Intelligent production control

Innova onboard packing system

Designed to meet the requirements of the marine sector

- User friendly registration terminals
- Manages both trips and hauls
- Easy reporting and label design
- Full Traceability
- QC System
- Connection to GPS devices
- Master data management with other ships and plants (SIF report)

Curio - *our newest family member*


ROBOTICS
INDUSTRY4.0
3D

Industry 4.0

CLOUD

AI / MACHINE LEARNING

SOFTWARE INTEGRATION

BIG DATA & ANALYTICS

INTERNET OF THINGS

SENSORS AND PREDICTIVE MAINTAINANCE

DATA DRIVEN QUALITY CONTROL

SMART SUPPLY NETWORK

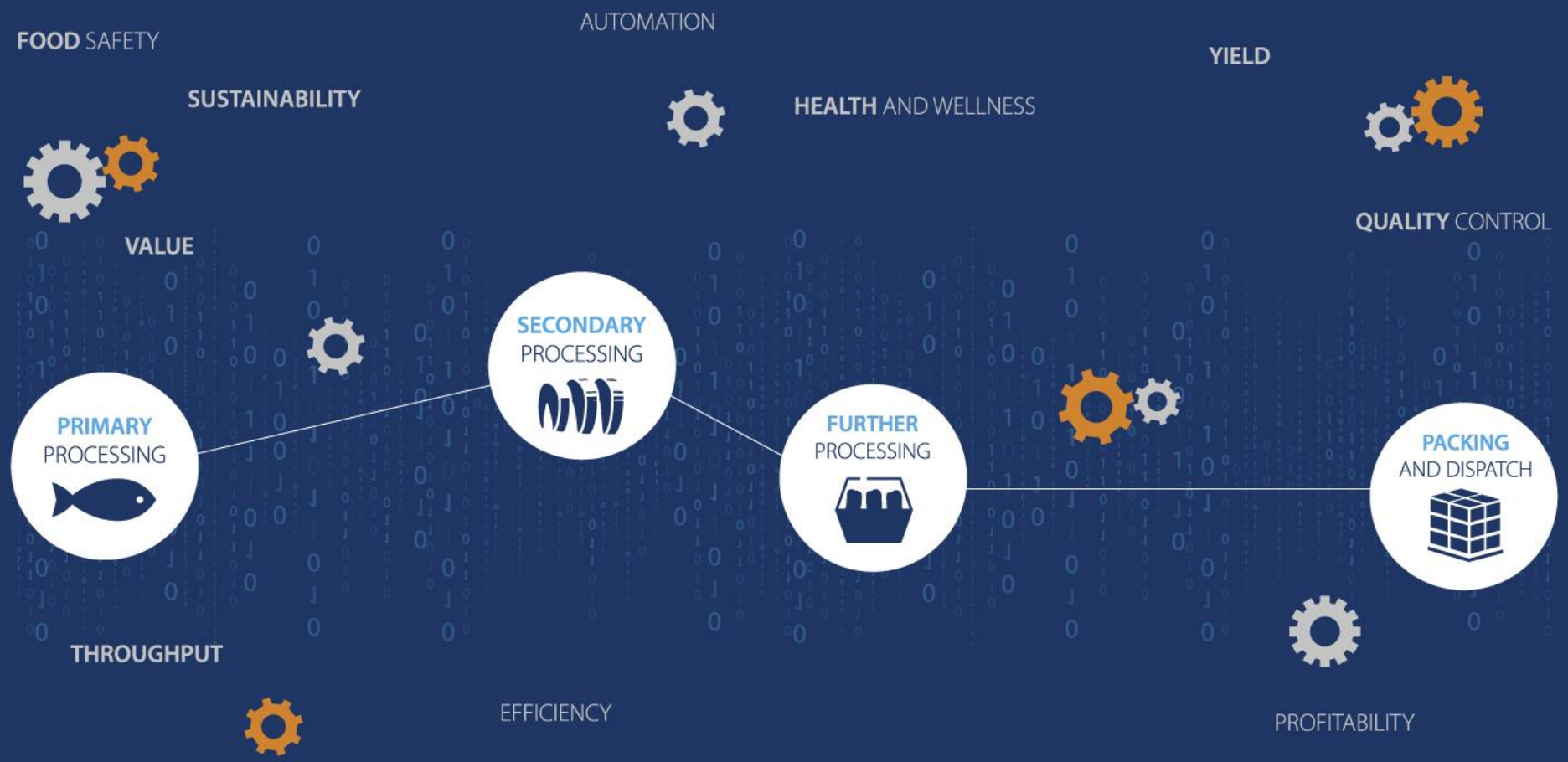
AUTONOMOUS ROBOTS

VIRTUAL / AUGMENTED REALITY

SIMULATION

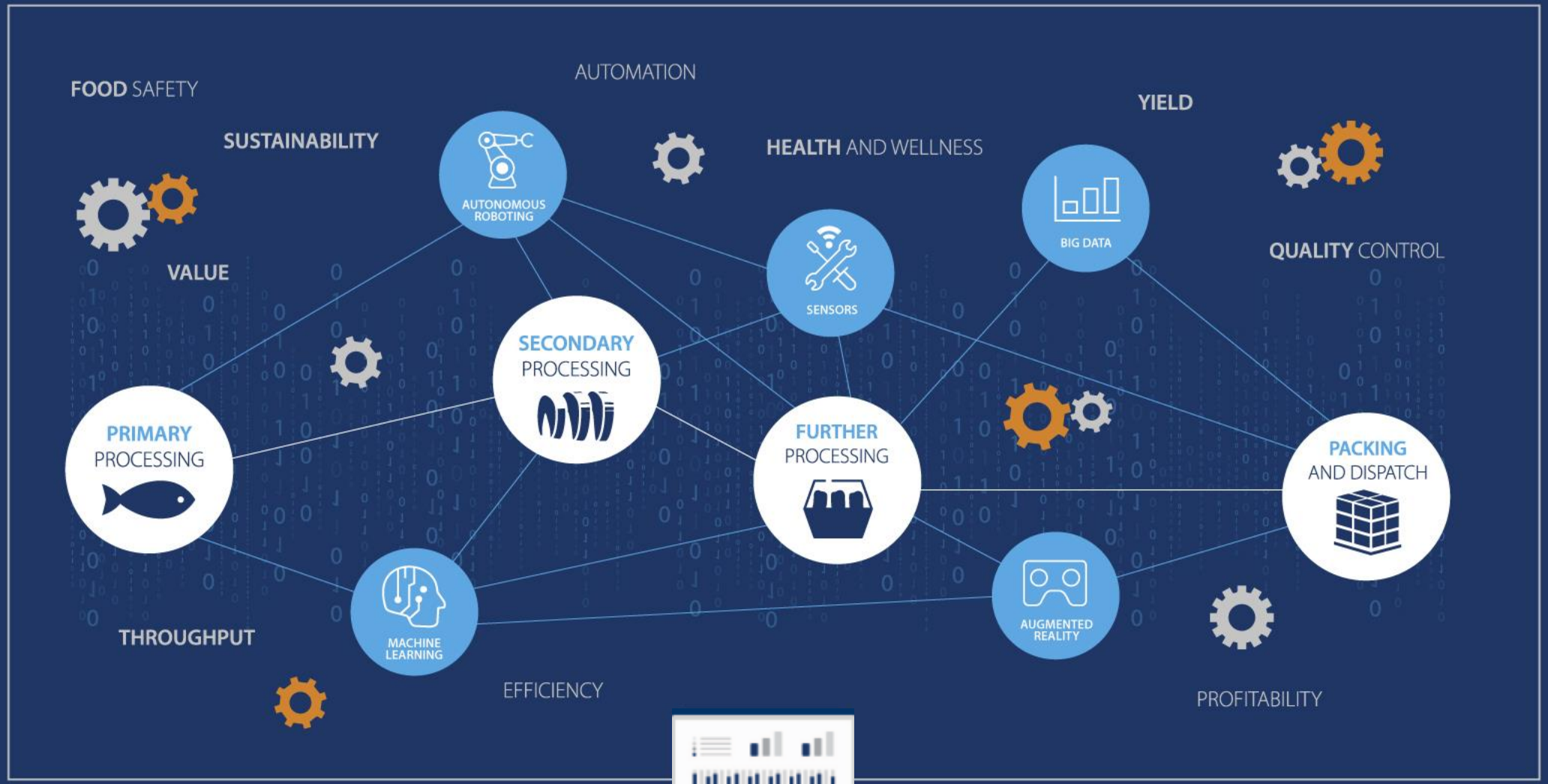
3D PRINTING

PRIMARY
PROCESSING
SECONDARY
PROCESSING
FURTHER
PROCESSING
PACKING
AND DISPATCH


FOOD SAFETY
AUTOMATION
SUSTAINABILITY
HEALTH AND WELLNESS
YIELD
QUALITY CONTROL
VALUE
PRIMARY PROCESSING
SECONDARY PROCESSING
FURTHER PROCESSING
PACKING AND DISPATCH
THROUGHPUT
EFFICIENCY
PROFITABILITY

SMARTER PROCESSING

ARE YOU READY?



INNOVA
Food Processing Software

marel

Marel is investing in **Digital**

To deliver on the **Digital** vision

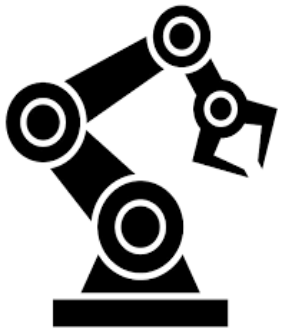
- Marel **doubled** the Software R&D investment in 2018
- and we are **increasing** our investment in coming years

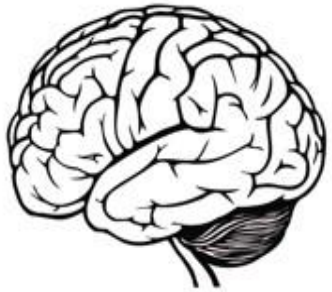
Focus on **infrastructure**, **big data**, and **artificial intelligence**.

Marel has added a new **Software Development Center** in Seattle.

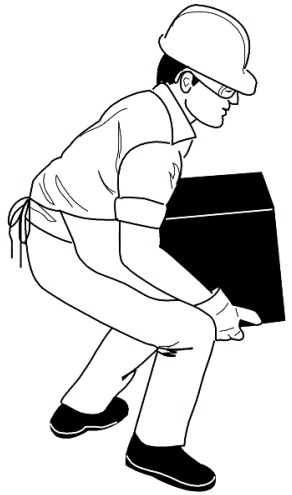
The Entrance of Robotics into the Food Processing Sector

Robots = **Vision** + **Intelligence** + **Action**





What drives the need for Robotics?



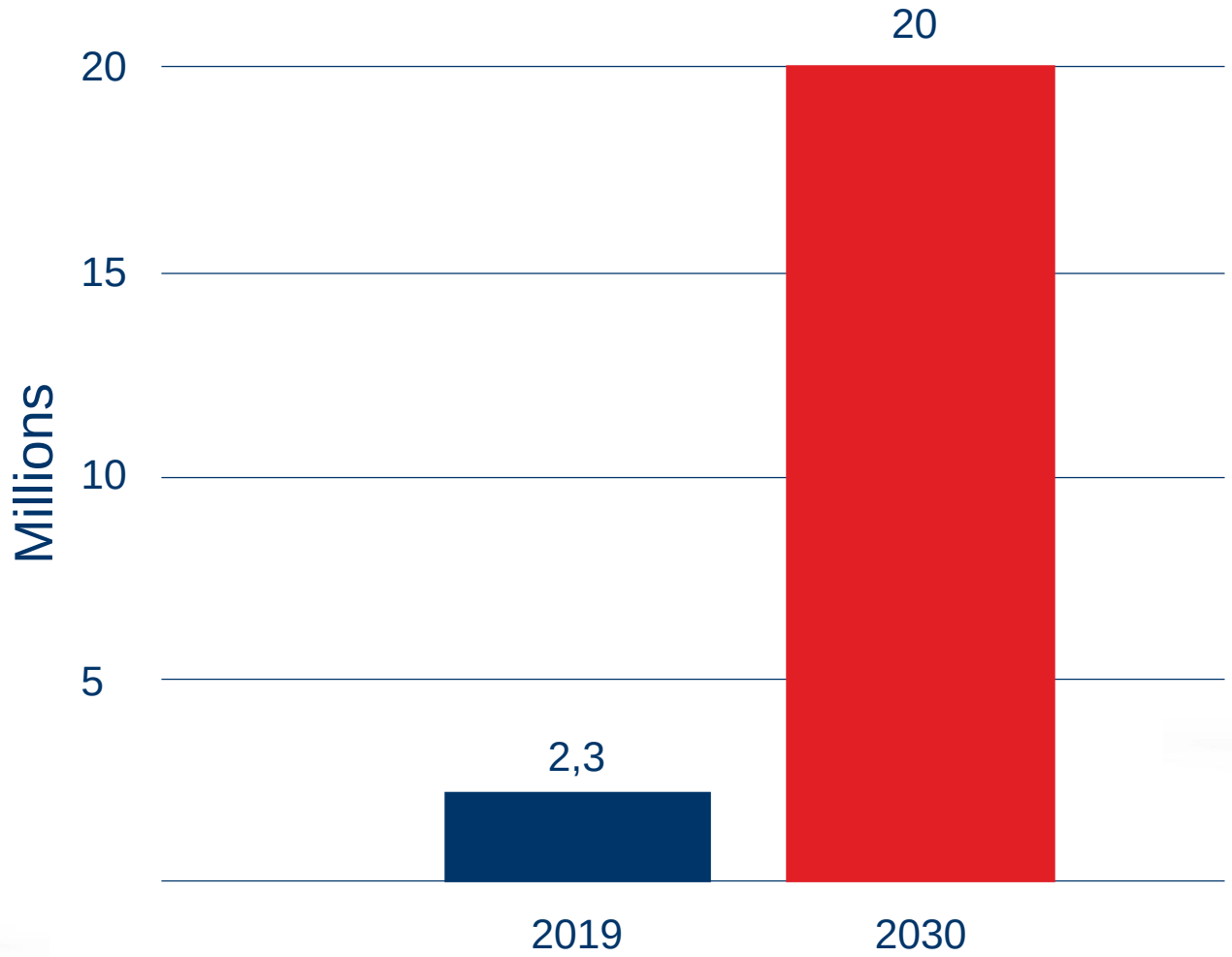
LABOUR SCARCITY

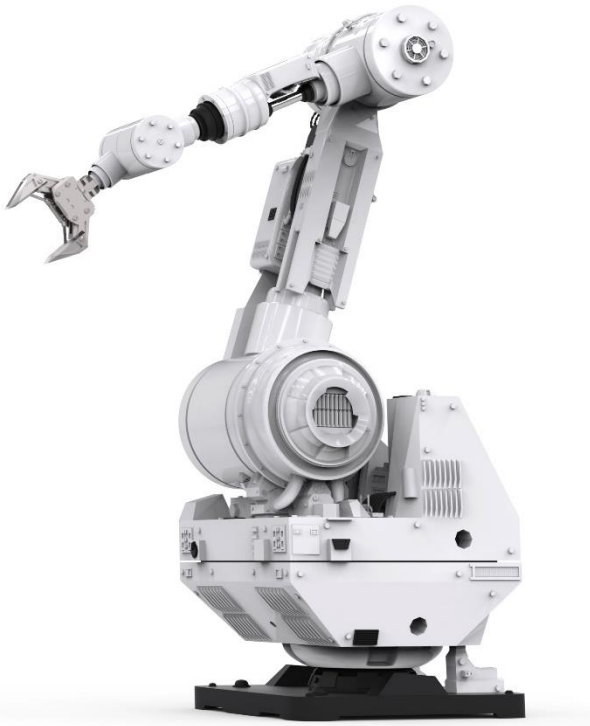
MONOTONOUS AND HARD JOBS

FOOD SAFETY

YIELD AND EFFICIENCY

Robots are Changing the World



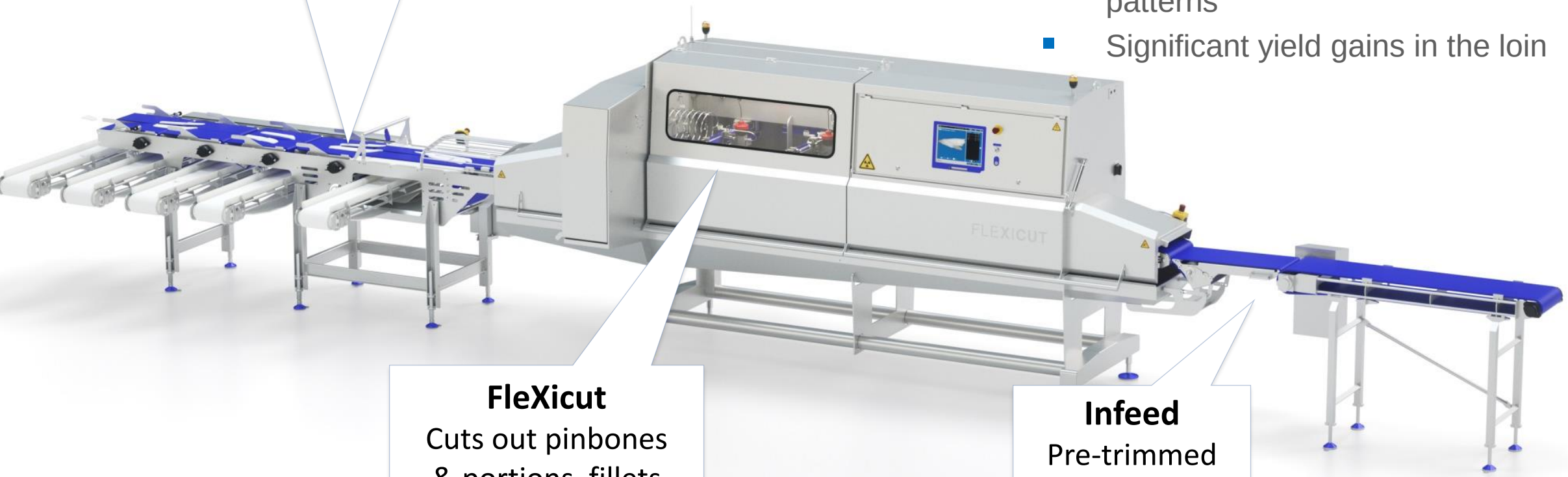


Heimild: Oxford Economics

FleXicut and FleXisort

- Capacity: 0,42 m/sek (1,4 ft/sek)
- High-precision X-ray bone detection
- Water-jets cut away pinbone
- Blade knives cut into portions up to 1000 cuts per minute
- High flexibility & variety in cutting patterns
- Significant yield gains in the loin

FleXisort
Automatic pinbone removal
& Product distribution

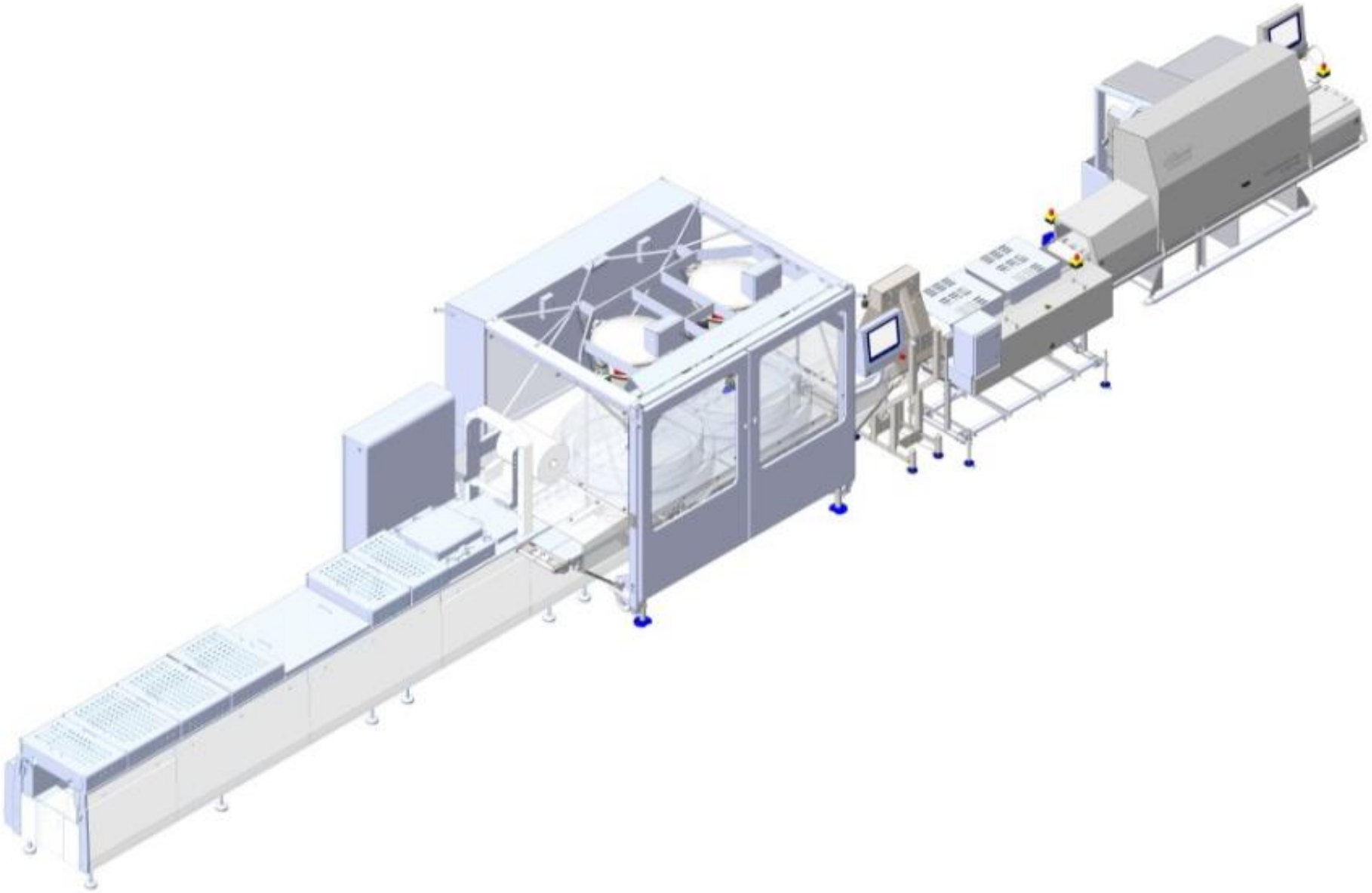


FleXicut
Cuts out pinbones
& portions fillets

Infeed
Pre-trimmed
whitefish fillets

FleXicut Onboard

RoboBatching – *batching into Thermoformer*



RoboBatching – *batching into boxes*

RoboBatching – *batching into boxes*

Automatic QC of fillets using machine learning

- Developed for visual quality control
- Weight estimation
- Grading based on certain parameters
- Active feedback to Filleting machines
- 100% quality documentation

Exciting times ahead

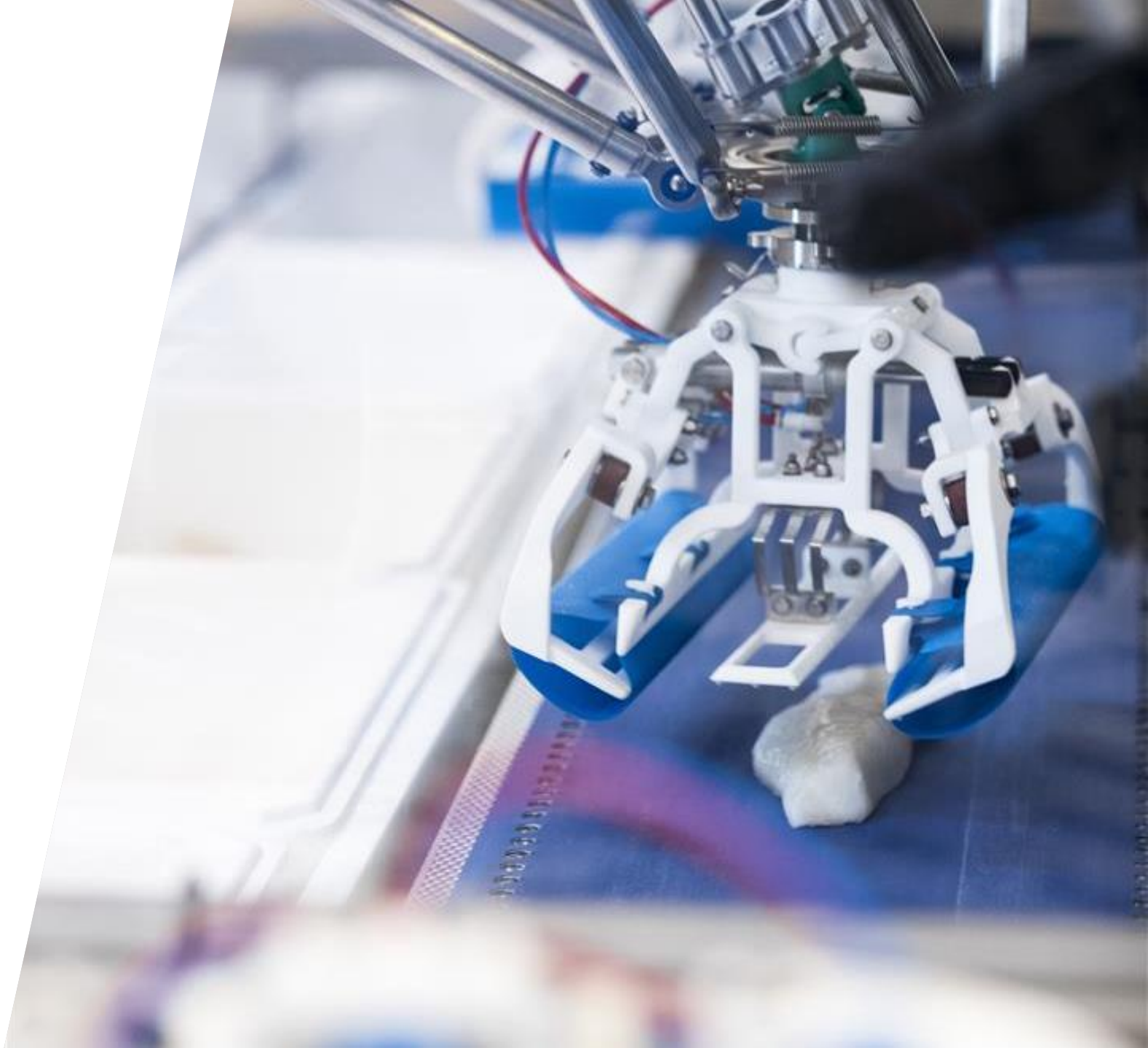
„THE BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT“

Peter Drucker

LETS CREATE
THE FUTURE ***- TOGETHER***

and transform the way food is processed

THANK YOU!



ADVANCING
FOOD PROCESSING