BUILDING A RESILENT, SMARTER, FASTER VALUE CHAIN

Emilio Anglés Isern
Industry 4.0 Development Lead

Kellanova

117-Year Heritage, Progressive Growth

1906 - Kellogg Company founded

Canadian expansion

Overseas expansion into UK, Australia

1950s – Latin America, Mexico entry

1960s – Asia, Japan entry

Expands into select Frozen Food products in U.S. and bars

Eggo

Nutri-Grain

Enters biscuits, cookies, crackers categories with Keebler acquisition

Keebler

Acquired Pringles

Pringles

Wilmar International joint venture

Tolaram Africa joint venture

Tolaram Group

Acquired Mass Food Group, leading Egyptian cereal company

MASS FOOD

Acquired RXBAR, fastest-growing US nutrition bar brand

RXBAR

Launched Deploy for Growth Strategy

Divested Keebler cookies and related businesses

Kellanova

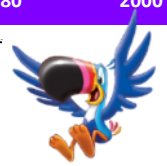
Kellanova and WK Kellogg Co become independent, separate companies

1906 1920 1940 1960 1980 2000 2012 2013 2014 2015 2016 2017 2018 2019 2022 2023

Numerous iconic foods launched from the 1930s to the 1980s

ALL-BRAN

Special K



Acquired Kashi and MorningStar Farms soy-based vegetarian foods

Kashi

MorningStar Farms

$14.6 billion in sales

Acquired Bisco Misr, Egyptian biscuits company

Bisco Misr

Acquired Parati, leading Brazilian biscuits, pasta and powder beverage company

Parati

Kellogg expands partnership with Tolaram in West Africa

Tolaram Group

Announced plan to separate North American cereal business, WK Kellogg Co

Kellanova

Kellogg's
CLUB
crackers

TOWN
HOUSE

Kellogg's
INSTANT
Noodles

PRINGLES

Kellogg's
RICE KRISPIES
TREATS
CRISPY MARSHMALLOW SQUARES

Gardenburger

pop
tarts

ZUCARITAS

Kellanova

SPECIAL
K

CHEEZ-IT
baked snack crackers

MorningStar
FARMS

INCOGmeato
MorningStar
FARMS

RXBAR

NUTRI
GRAIN

CRUNCHY
NUT

Eggo

coco
pops

Bringing our Best to the World

Over 1,000 products marketed in

180+ countries

~25,000 employees globally

Kellanova

Kellanova in Europe

Kellanova in Europe

Headquarters - Dublin (Ireland)

1x K-Snacks plant:

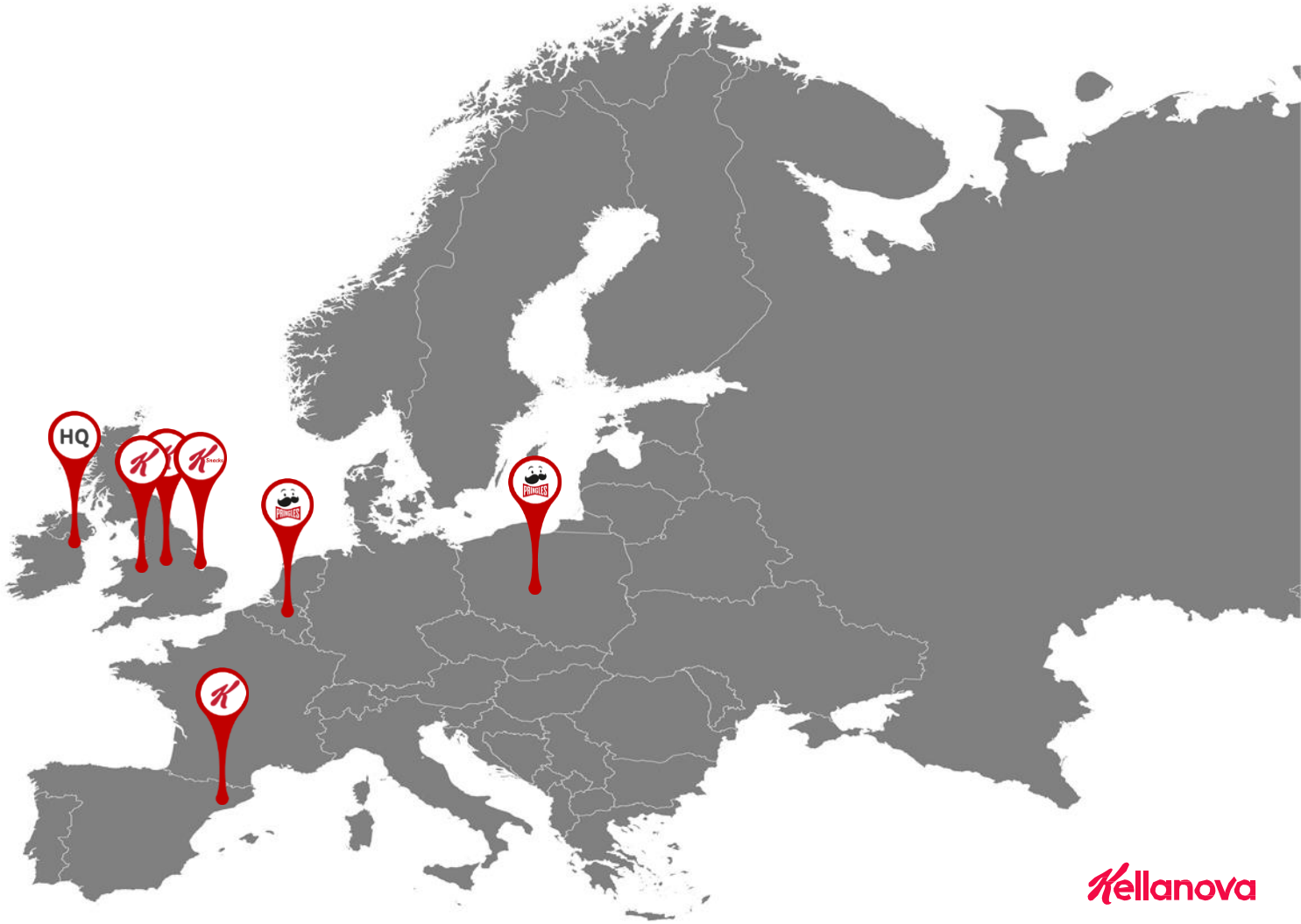
- Wrexham (UK)

2x Pringles plants:

- Mechelen (Belgium)
- Kutno (Poland)

3x Cereal plants:

- Wrexham (UK)
- Manchester (UK)
- Valls (Catalunya)



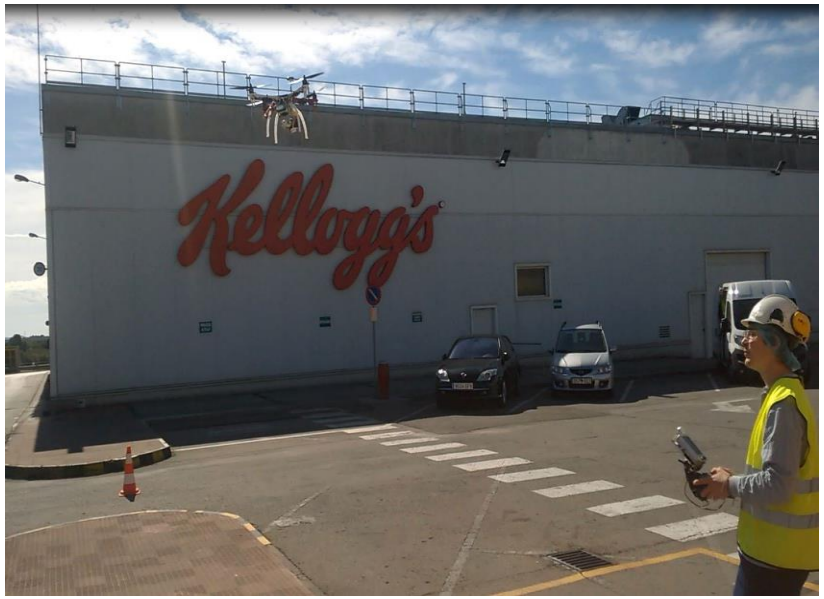
Kellanova in Valls

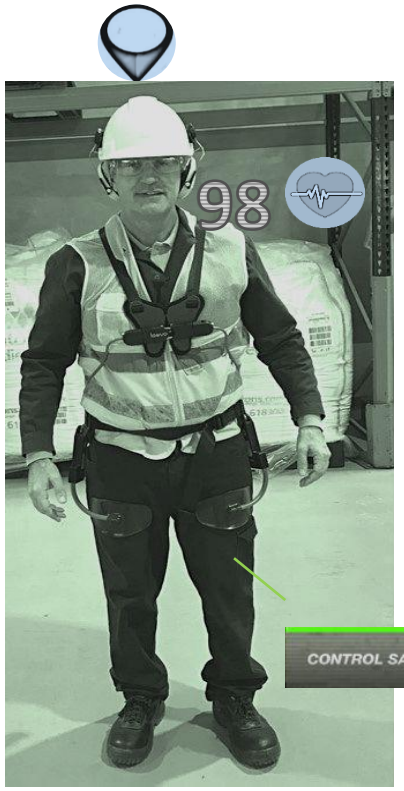
In Valls since **1980**
47,000 m2
Progressive growth
Plant + Distribution Centres

325 team membres (direct)
Gender **parity** at leadership level

24 hrs / **7** days
14 products
+100 SKUs
80% export **+20** countries

65,000 tn production
600,000 cartons/day
6 milion breakfasts/day

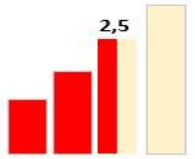




"Me lo contaron y lo olvidé; lo vi y lo entendí; lo hice y lo aprendí."

- Confucio, Maestro y filósofo chino -

HITOS: INDUSTRIA 4.0 APLICADA A VALLS MANUFACTURING



SIEMENS
Schneider Electric
INICIO AUTOMATIZACIÓN PROCESO PRODUCTIVO

COMUNICACIÓN PLC'S

PLC 's S7 400 + INDUSTRIAL ETHERNET

PLANT FLOOR DATA COLLECTION SYSTEM

IMPLANTACIÓN ERP

ACCESO REMOTO AL PROCESO PRODUCTIVO
ROBOTS ABB PALETIZADO

RED FIBRA OPTICA + NETWORKING

WEOL: VIRTUALIZACION

MODELO ISA 95 MEDIANTE OPC

PROYECTO WMS RAW MATERIAL

smart factory

1980 | 1981 | 1991 | 1998 | 2003 | 2005 | 2008 | 2009 | 2012 | 2013 | 2015 | 2016 | 2019 | 2025

INAUGURACIÓN PLANTA COCCIÓN 1

TORRE + REC 1

REC 2

COCCIÓN 2

Proyecto SK

PROYECTO PARKER

Lean

PROYECTO PAKO

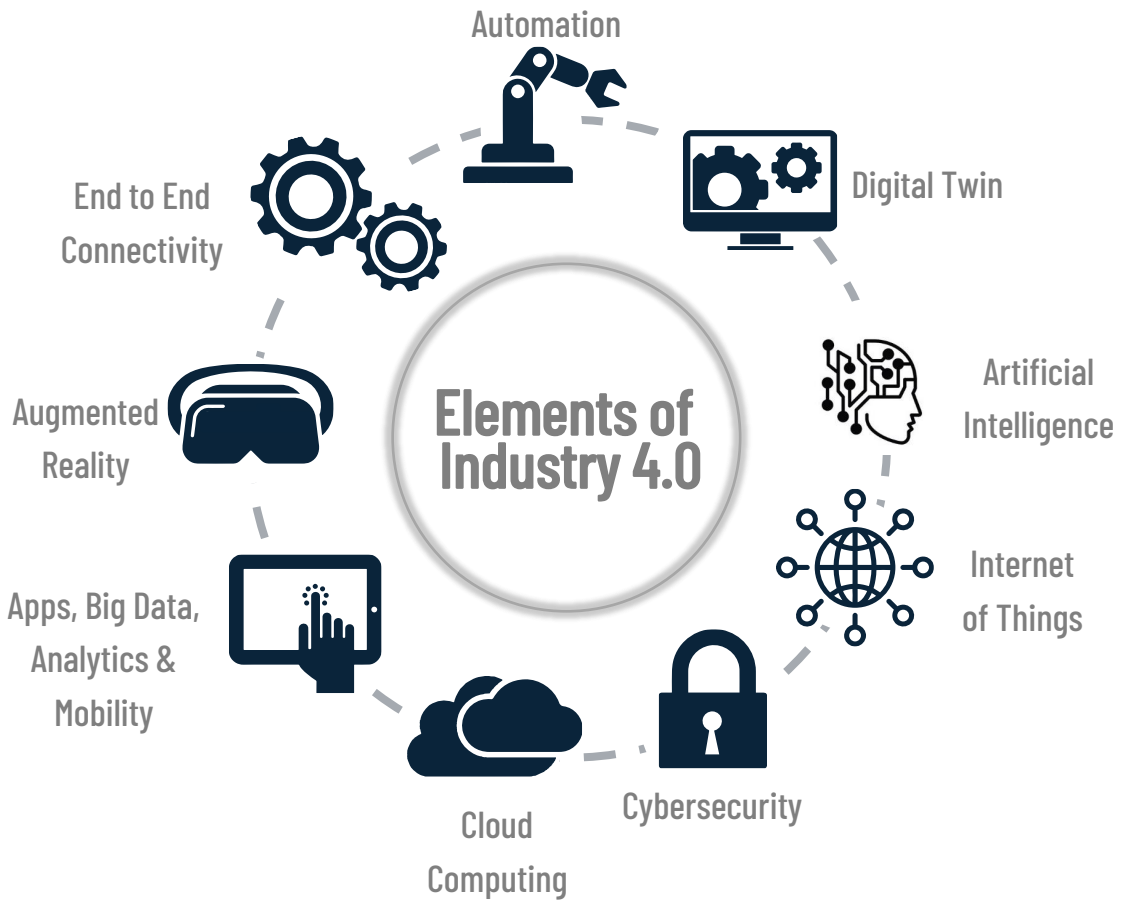
WS

SECADERO COCCIÓN 1

Industria 4.0

ACCESO AL PROCESO: MES 4.0
ROBOTS COLABORATIVOS
GEMELO DIGITAL
VISION ARTIFICIAL
IMPRESIÓN 3D/ADITIVA
REALIDAD AUMENTADA
MACHINE LEARNIG
REALIDAD VIRTUAL

Kellanova



WHERE TO GO NEXT?

Kellanova

INDUSTRY 4.0 MUST HELP US IN OUR CHALLENGES

To drive **productivity** improvement

2. We must improve the growth trajectory and economics of our Cereal business

To **attract, retain** and **engage** our people in delivering **top tier performance**

FOCUSED AUTOMATION WITH PRODUCTIVITY MINDSET

We are already a highly automated factory, but we think there is still opportunity.

Key milestones achieved to date:

1. Time/motion study to quantify manual intensive/repetitive tasks.
2. Defined the potential technology applications and partners.
3. Productivity pilots/PoC (IRR>50%).

VALLS 4.0: OUR INDUSTRY 4.0 STRATEGY

Envisioning how to leverage Industry 4.0 Technologies at Valls to drive **productivity, performance** and **people engagement.**

Smart Factory to boost KWS

Focused Automation & Digitalisation

Valls Plant Employee 4.0

SMART FACTORY TO BOOST KWS

Data → Insights → Action → Results

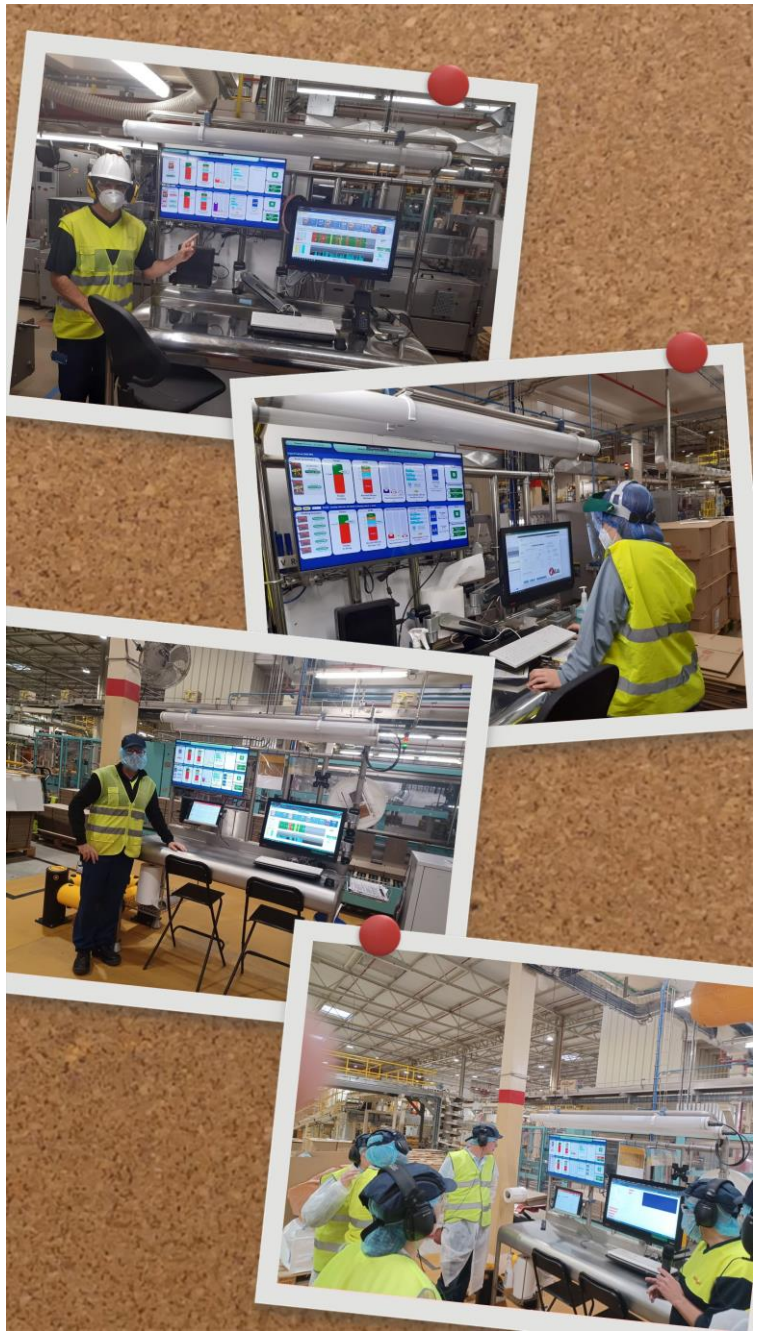
PROCESSES & CAPABILITY

Build capability in our processes and teams to improve results.

+

EFFICIENT TOOLS & APPLICATIONS

Easy access to 'real-time' data and trends with simplified, integrated and connected tools and applications.



Kellanova

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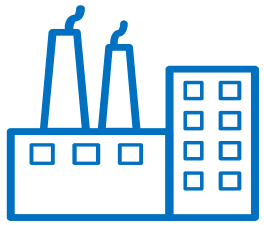
INDUSTRY 4.0 STREAMS IN DEVELOPMENT

CONTROL TOWER 1

FROM : Operators accountable for process control and field operations (operate, check, clean, maintain).

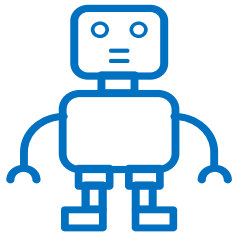
TO : Centralize process control, automate and outsource tasks.



ROBOTICS 2

FROM : High frequency manual tasks, ergonomic hazards.

TO : Automate task to:
- Reduce # FTE, or
- Create time for KWS



LINE SUPPLY 3

FROM : Manual supply of material to the packing lines, FLT/pedestrian safety hazards.

TO : Auto guided vehicles supplying material to the packing lines.

ARTIFICIAL INTELLIGENCE 4

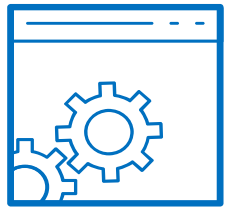
FROM : Decisions based on intuition and operators experience.

TO : Data models and algorism decisions based.

DIGITAL TWIN 5

FROM : Weeks or months to find breakdown root causes or quality issues.

TO : Days or hours to find solutions.



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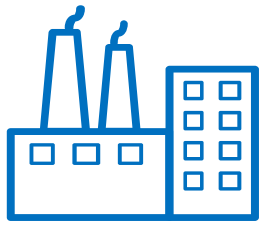


PROCESS CONTROL TOWER: CONCEPT IN DEVELOPMENT

CENTRALISED CONTROL ROOM WITH CCTV VISION

CONNECTED WORKER-HEADSETS

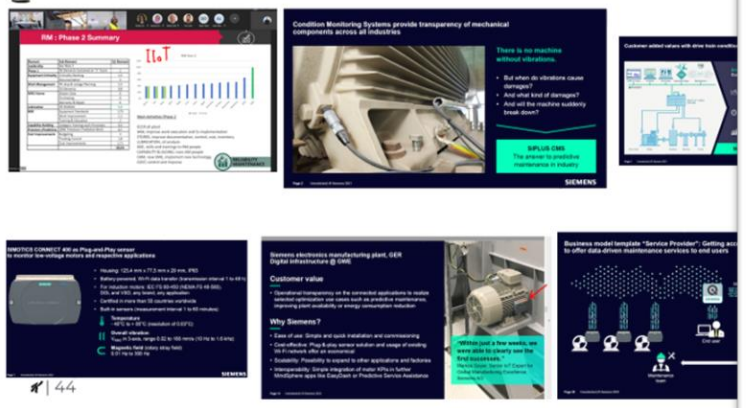
Take advantatge of the 4.0 techno

CONNECTED WORKER

Take advantatge of the 4.0 technologies

AUTOMATION HUMIDITY-CAN WEIGHT

IIOT- SIEMENS APPROACH



AUTOMATION-INFRARED SYSTEM

Sistemas termográficos para el exterior de hornos-motores críticos, etc **PROYECTO PHOENIX**

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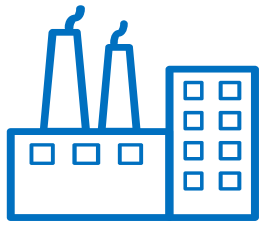

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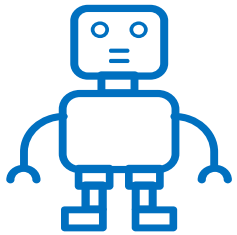


BAG-PACK LINE COBOT: PROOF OF CONCEPT

Before

Investment: 100K
Cobot to stack cases in pallet.

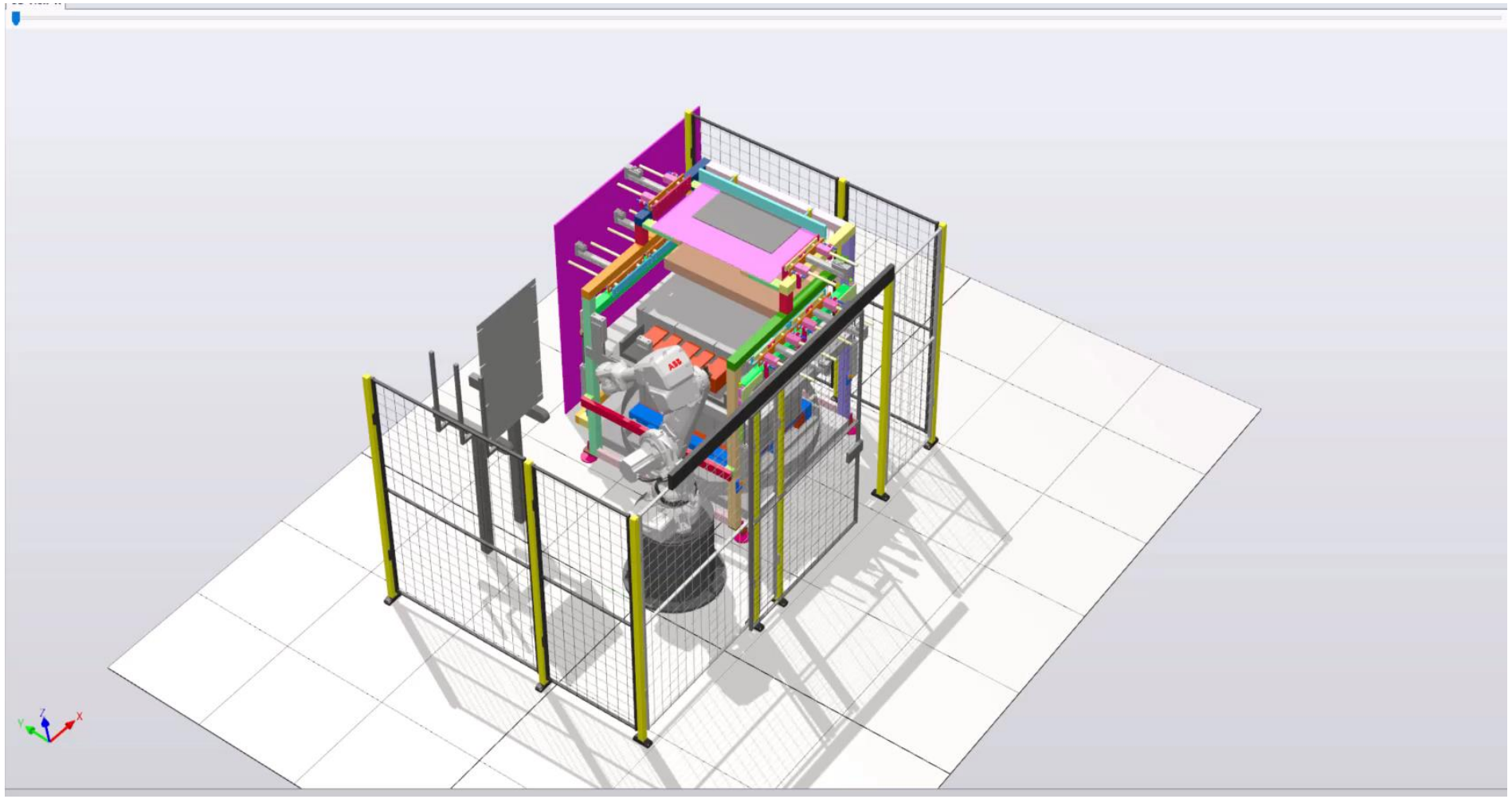
Output per shift doubled
Ergonomic improvement.

Savings 50k
IIR: 50%

After

SUCCESS

ROBOTS TO FEED CASES: FOUR PACKING LINES ROBOTS IN CONSTRUCTION



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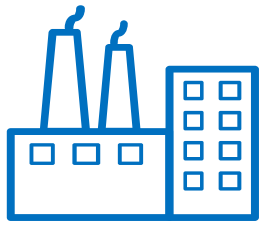

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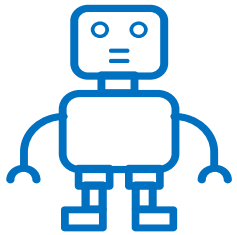

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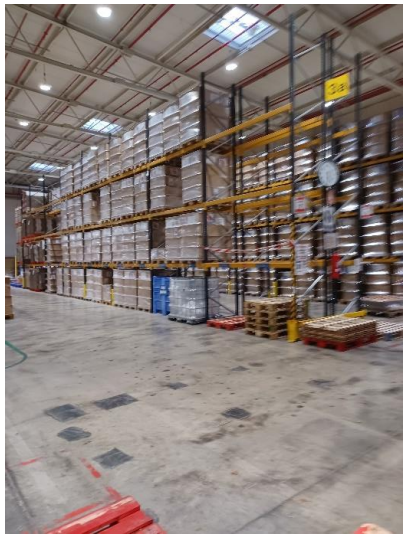
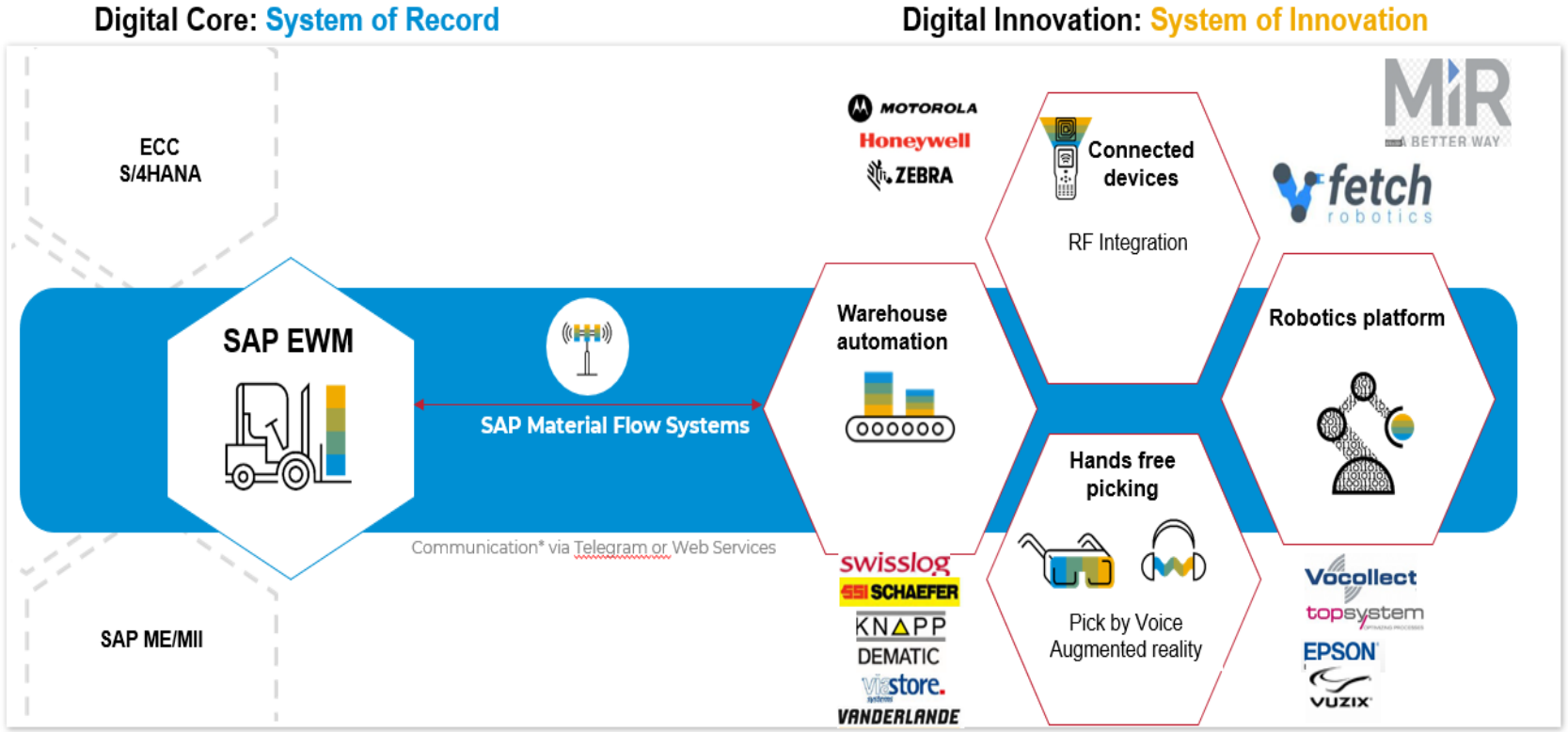
AUTONOMOUS LINE SUPPLY





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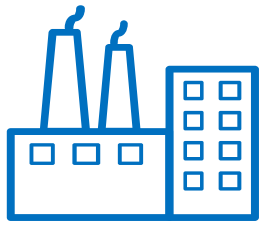

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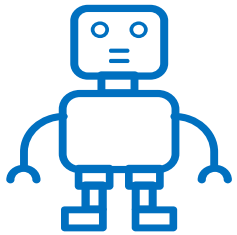

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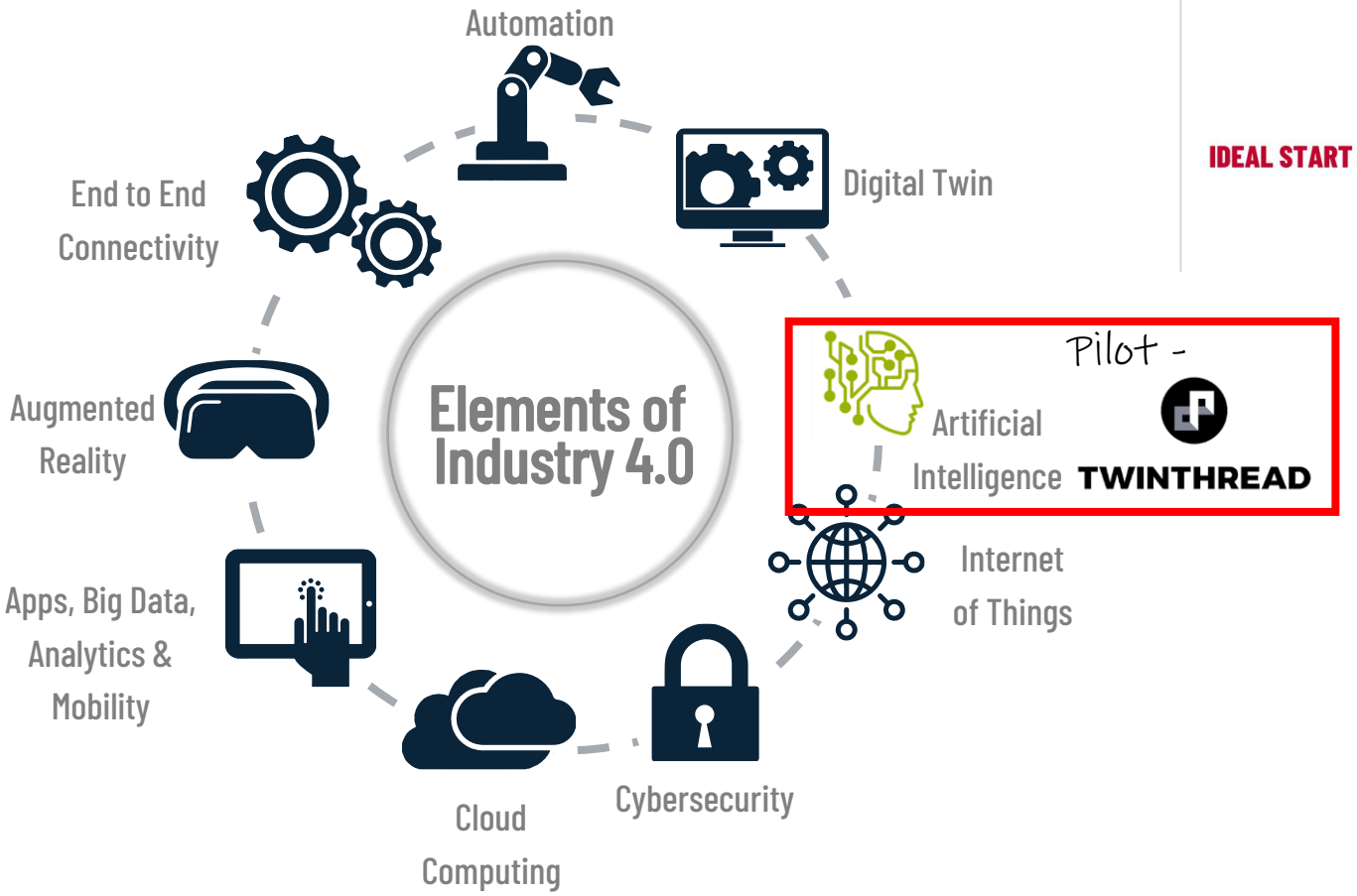
AI: EXTRUSION PILOT

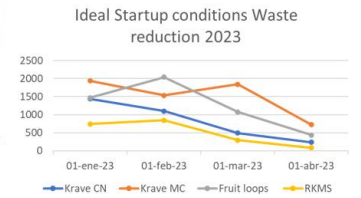


PREDICTIVE CONTROL HOW?

Perfect Product

IDEAL RUNNING

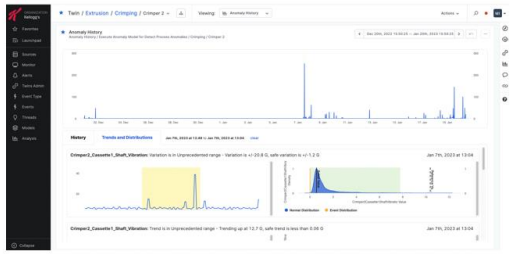
IDEAL START UP



PREDICTIVE ANALYTICS

Zero Breakdowns

Crimper Vibration levels



Valls, What does it mean?

Kellanova

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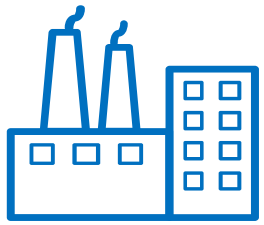

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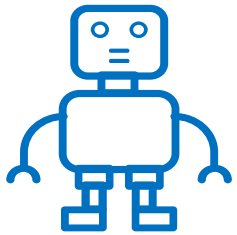

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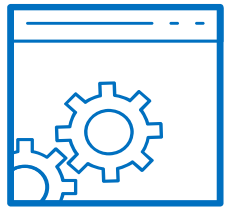

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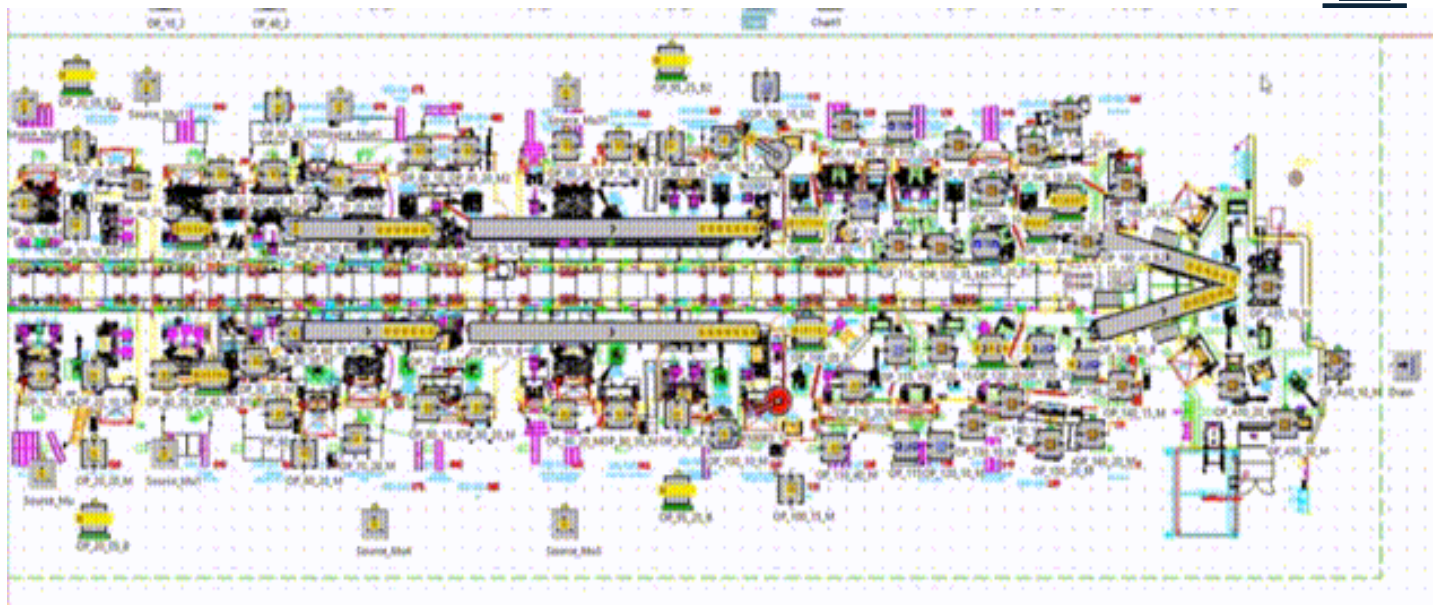

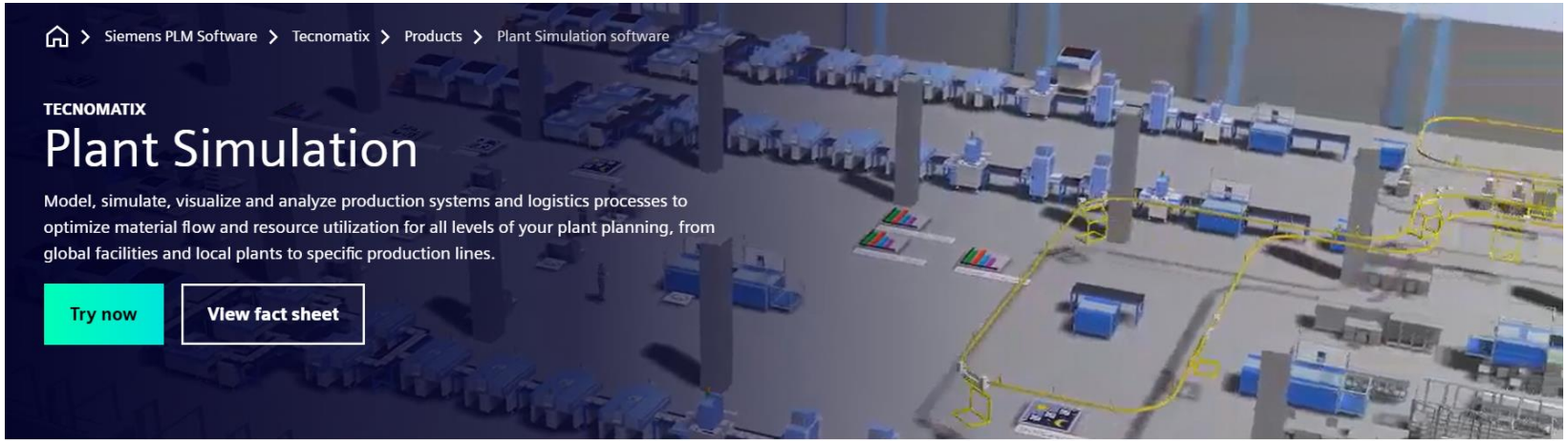

Capacity Increase

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Envisioning how to leverage Industry 4.0 Technologies at Valls to drive **productivity, performance** and **people engagement.**

Smart Factory to boost KWS

Focused Automation & Digitalisation

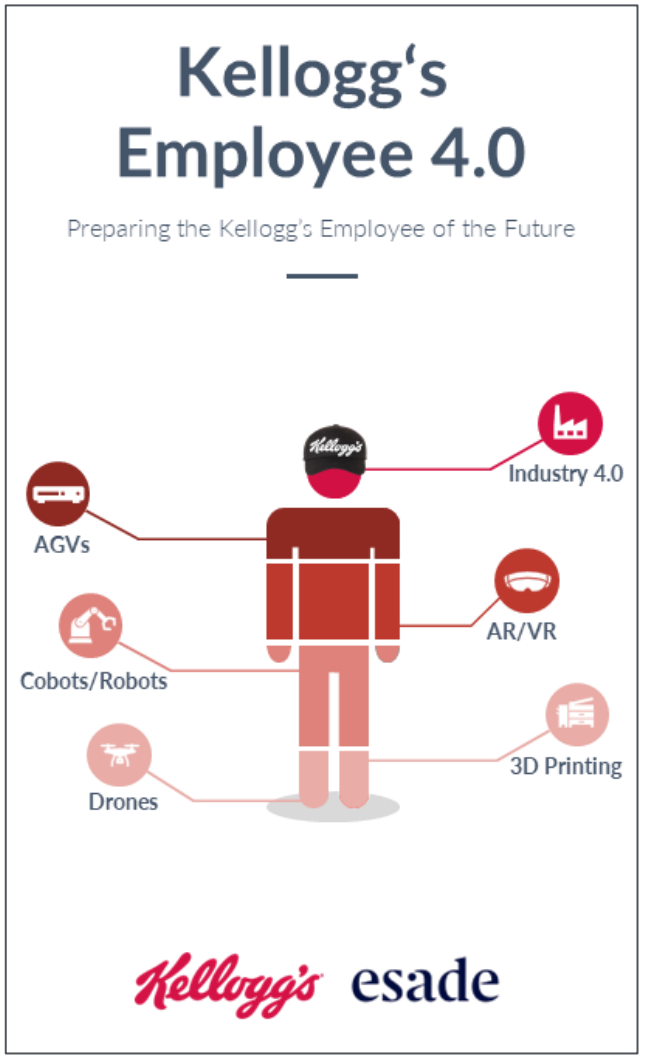
Valls Plant Employee 4.0

VALLS PLANT EMPLOYEE 4.0

CHANGE MANAGEMENT

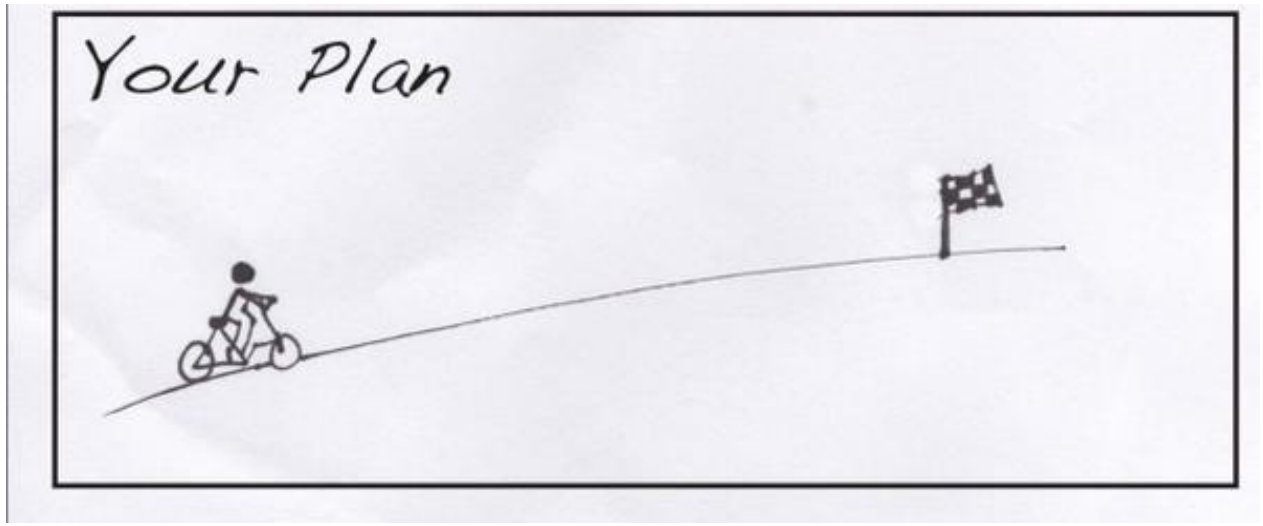
TRAINING/CAPABILITY PLAN

RECRUITMENT STRATEGIES



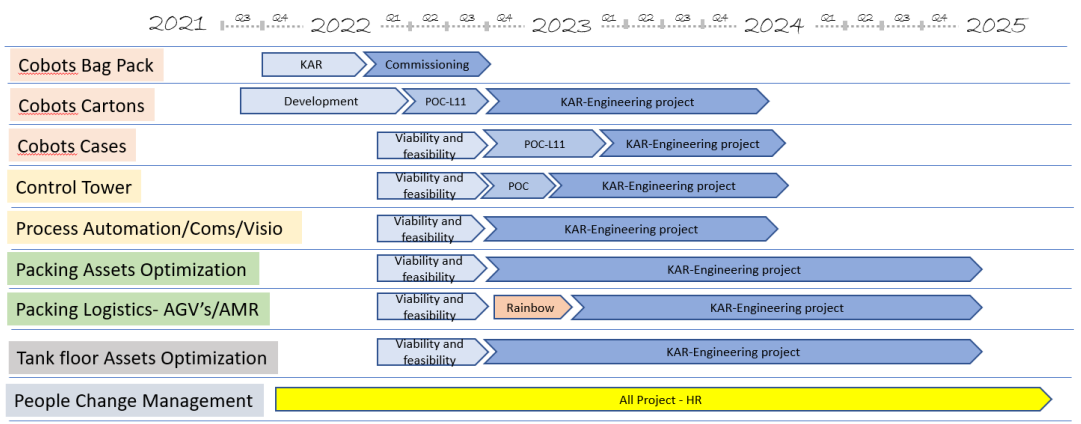
Kellanova

VALLS 4.0 "NIMBLE LEARNING"



Timeline High level Valls 4.0

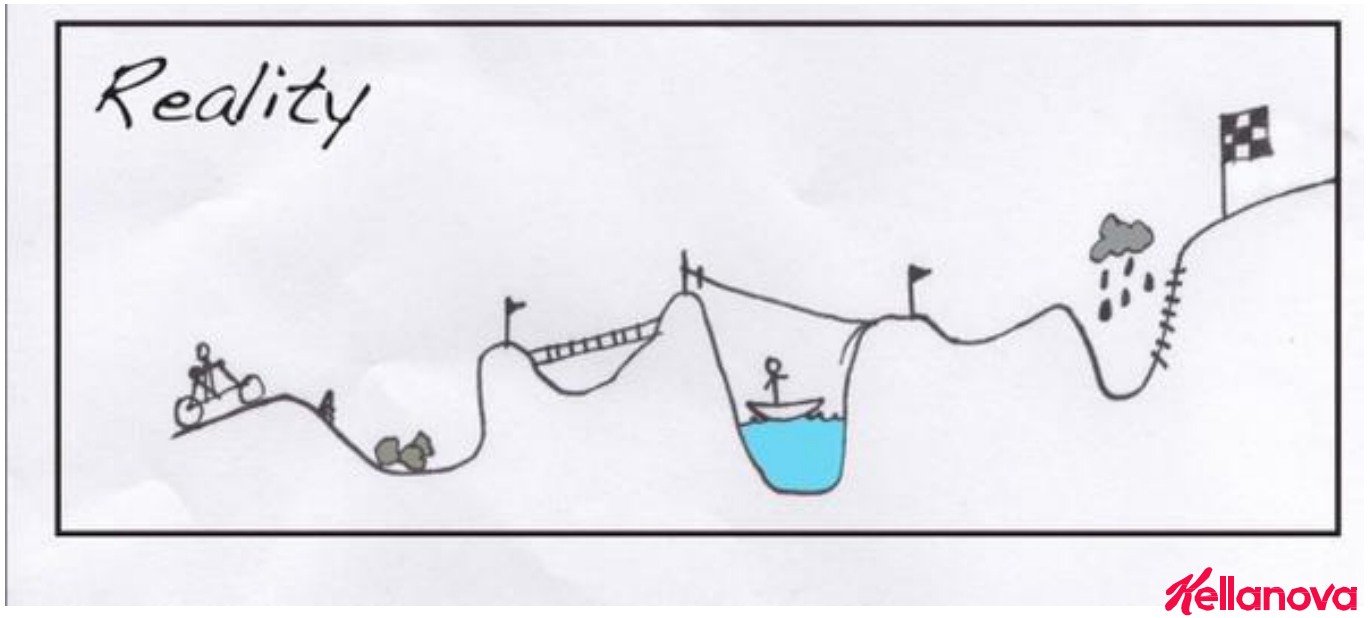
€ = OTC 100K Viability and feasibility



VALLS 4.0 MSR3

Owner: Emili Angles

Industry 4.0 Streams	% Completed 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%	Status	Tech Maturity Grade	Tech Feasibility	Complexity	Risk	Status
1 Bagpack Cobot		Commissioned in Q1 -2022					
Project-Capital Approved in 2021-Executed Q1/2022							
2 POC Feeding Cartons Cobot (200K€x7)		Further development needed					
Feasibility Study:Risk analysis (Tech / Financial) ABB							
Feasibility Study:Risk analysis (Tech / Financial) Eurecat							
Langen started a POC with Cobots. Lines 4-5-7							
VM Systems Tech Study							
3 Feeding Cases Cobot (150K€ X 7)		Further development needed					
Previous Technical/Economic Study - Maturity Degree							
Feasibility Study:Risk analysis (Ops/Tech / Financial)							
Smurfit Kappa Pallets test							
4 Control Tower & Automation (Head sets/AI Cameras/Humidity Sensors)		Pilot: Productivity KAR Launched					
Previous Technical/Economic Study - Maturity Degree							
Feasibility Study:Risk analysis (Ops/Tech / Financial)							
PILOT: Tank Floor Control Tower							
5 Packing Asset Optimization		High cost – Low IRR					
Previous Technical/Economic Study - Maturity Degree							
Feasibility Study:Risk analysis (Ops/Tech / Financial)							
Business case and Engineering Enabling KAR		Engineering project launched					
Engineering Project: Composite Pallet Labelling							
6 Packing logistics Automation		Further development needed after Rainbow					
Previous Technical/Economic Study - Maturity Degree							
Feasibility Study:Risk analysis (Ops/Tech / Financial)							
Rainbow Design Phase							
7 Tank Floor Assets Optimization		High cost – Low IRR					
Previous Technical/Economic Study - Maturity Degree							
8 People Change Management		Change Management started Tank Floor Control Tower					
Change Management PILOT: Tank Control Tower							
Total							



Kellanova

EMILI
Spain
Kellogg's
RUNNER
DRACS

Emilio Angles Isern

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Industry 4.0 💥Evangelist at Kellogg Company✦Co-founder Wakeup Agile🚀✦International Speaker✦Associate Professor

Talks about #industry40 and #digitaltransformation

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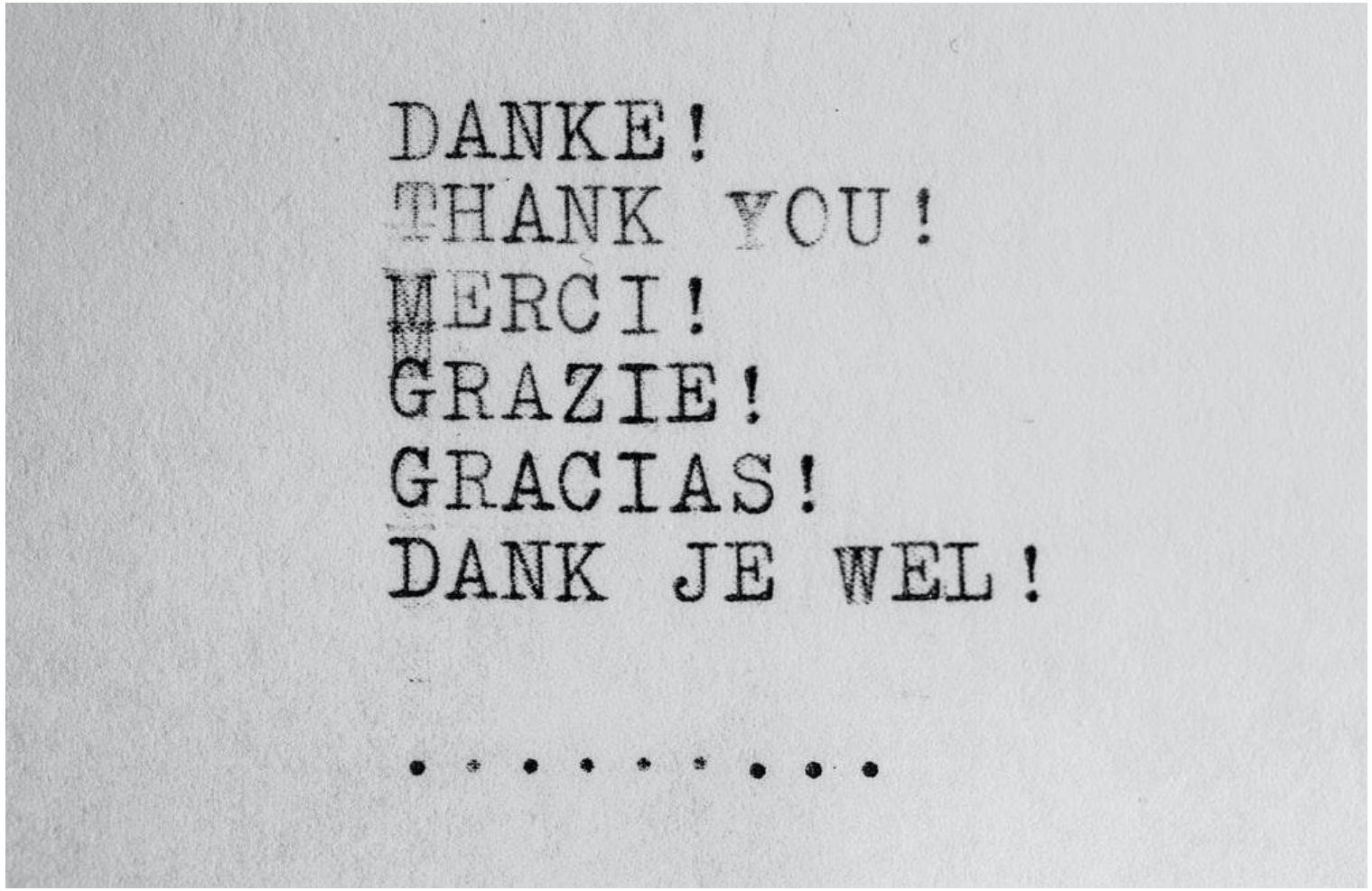
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