



BUILDING A RESILIENT, SMARTER,
FASTER VALUE CHAIN

Emilio Anglés Isern
Industry 4.0 Development Lead

Kellanova

117-Year Heritage, Progressive Growth



1906 - Kellogg Company founded



Overseas expansion into UK, Australia



Canadian expansion

1950s - Latin America, Mexico entry

1960s - Asia, Japan entry

Enters biscuits, cookies, crackers categories with Keebler acquisition



Acquired Pringles



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



Wilmar International joint venture

Tolaram Africa joint venture



Tolaram Group

Acquired Mass Food Group, leading Egyptian cereal company



Acquired RXBAR, fastest-growing US nutrition bar brand



Divested Keebler cookies and related businesses



Kellanova and WK Kellogg Co become independent, separate companies

Launched Deploy for Growth Strategy

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



Acquired Kashi and MorningStar Farms soy-based vegetarian foods



\$14.6 billion in sales

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



Acquired Bisco Misr, Egyptian biscuits company



Kellogg expands partnership with Tolaram in West Africa



Tolaram Group



Kellogg's
CLUB
crackers

**TOWN
HOUSE**

Kellogg's
INSTANT
Noodles



Kellogg's
**RICE KRISPIES
TREATS**
CRISPY MARSHMALLOW SQUARES

Gardenburger

**pop.
tarts**

ZUCARTAS

Kellanova

CHEEZ-IT
baked snack crackers

SPECIAL
K

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 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 members (direct)

Gender **parity** at leadership level



24 hrs / **7** days

14 products

+100 SKUs

80% export **+20** countries



65,000 tn production

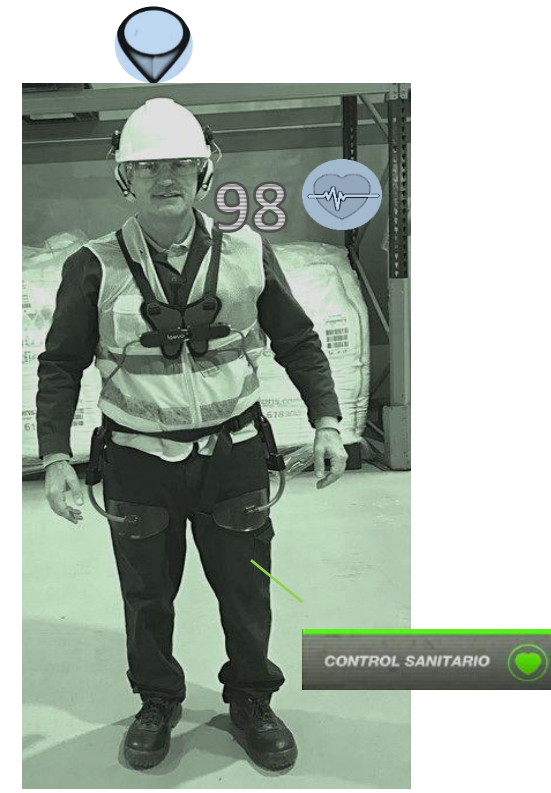
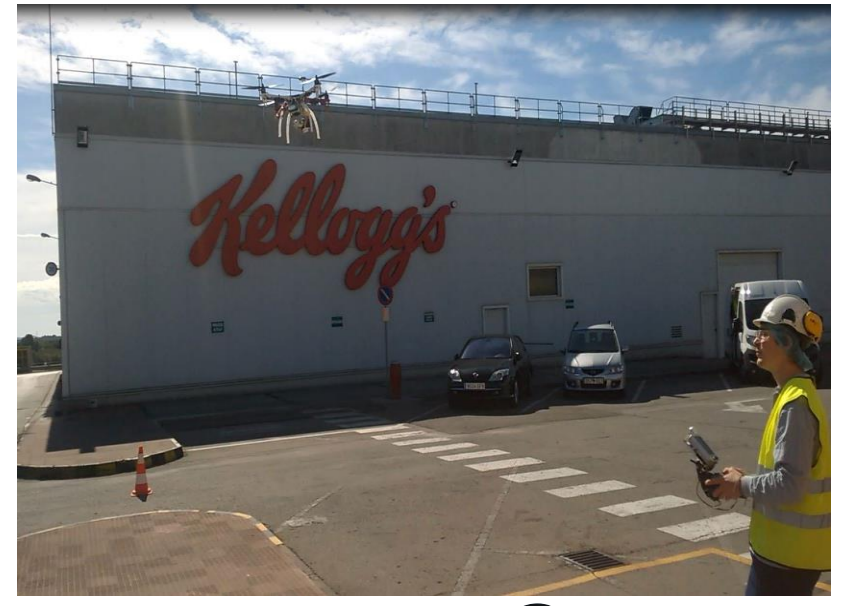
600,000 cartons/day

6 milion breakfasts/day



Kellanova

Kellanova



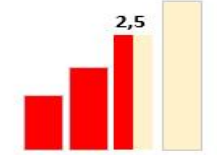
"Me lo contaron y lo olvidé; lo vi y lo entendí; lo hice y lo aprendí."

K

- Confucio, Maestro y filósofo chino -



HITOS: INDUSTRIA 4.0 APLICADA A VALLS MANUFACTURING



SIEMENS Schneider Electric
INICIO AUTOMATIZACIÓN PROCESO PRODUCTIVO

COMUNICACIÓN PLC'S Modbus

PLC 's S7 400 + INDUSTRIAL ETHERNET SIEMENS SIMATIC

PLANT FLOOR DATA COLLECTION SYSTEM

IMPLANTACIÓN ERP SAP

ACCESO REMOTO AL PROCESO PRODUCTIVO ROBOTS ABB PALETIZADO

RED FIBRA OPTICA + NETWORKING CISCO

WEOL: VIRTUALIZACIÓN vmware

MODELO ISA 95 MEDIANTE OPC Kepware

PROYECTO WMS RAW MATERIAL

amazon web services SAP

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



K Lean



PROYECTO PAKO



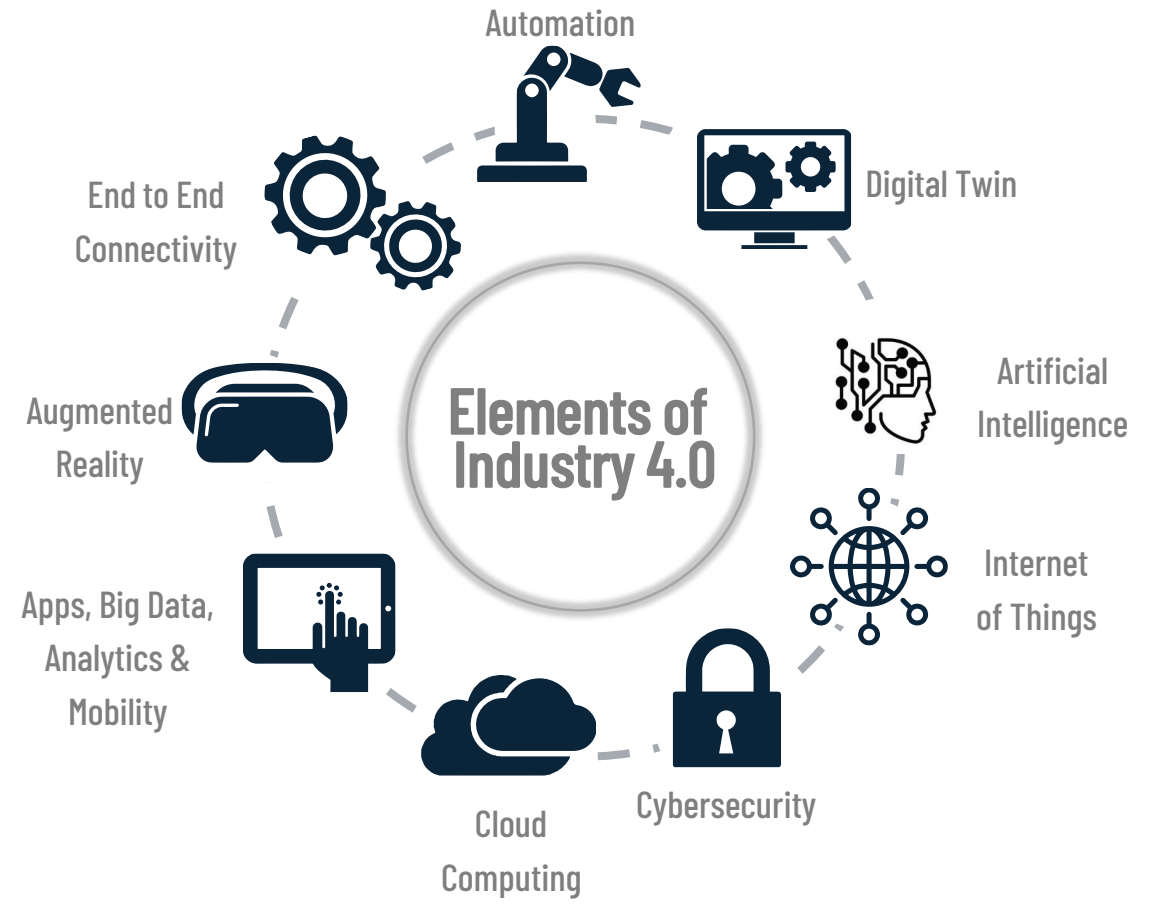
K WS



SECADERO COCCIÓN 1



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



WHERE TO GO NEXT?

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%).

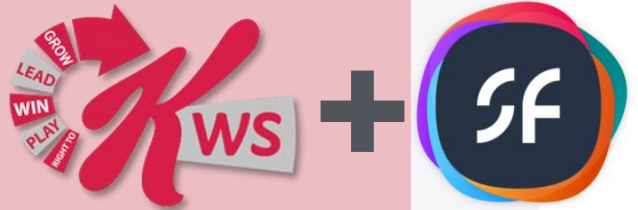


VALLS 4.0: OUR INDUSTRY 4.0 STRATEGY



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

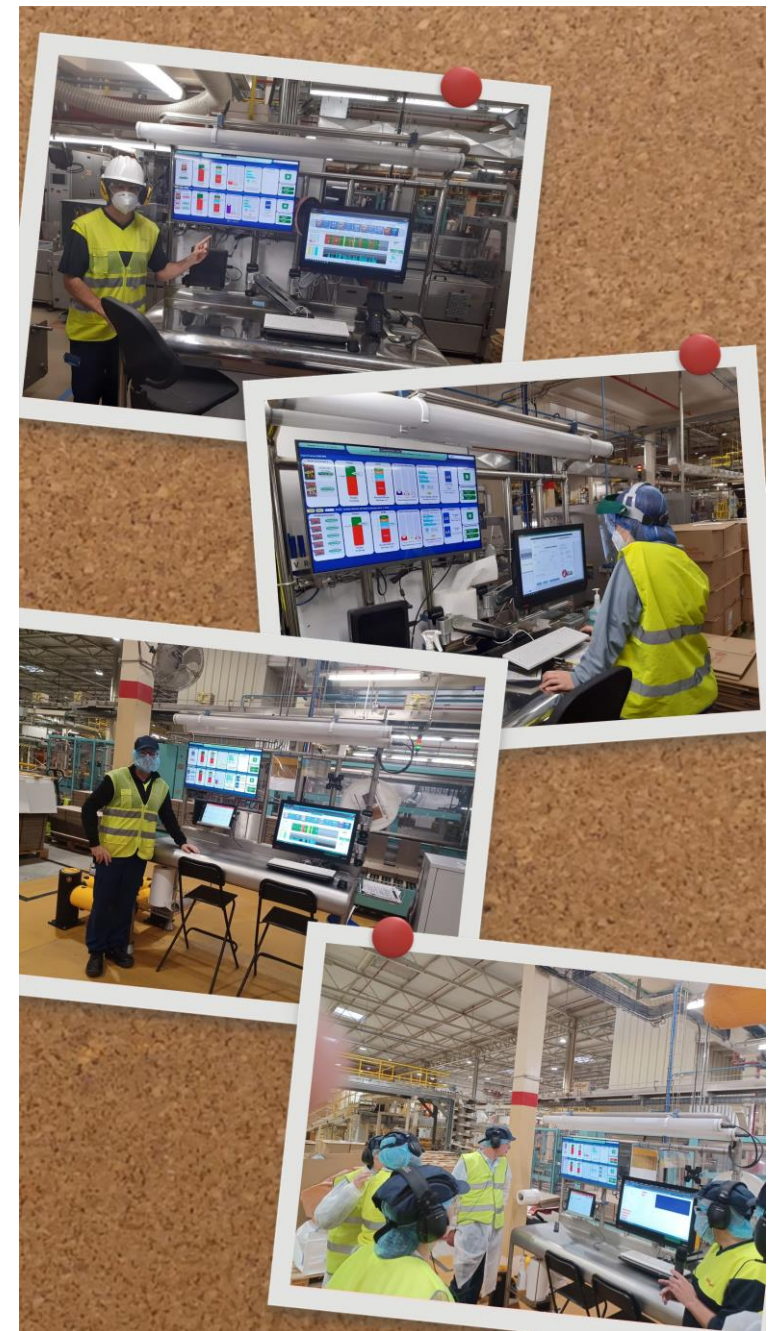


EFFICIENT TOOLS & APPLICATIONS



Build capability in our processes and teams to improve results.

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

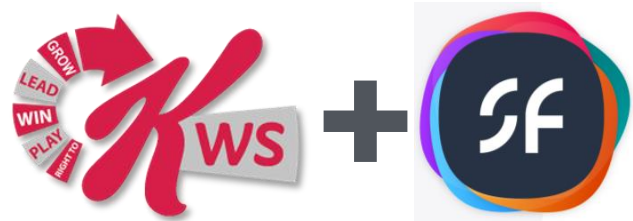


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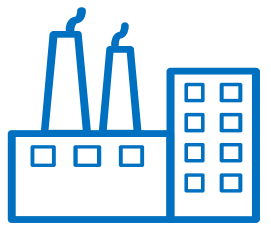
Valls Plant Employee 4.0

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.

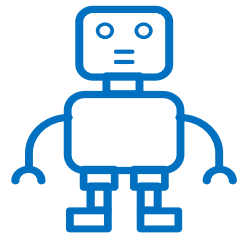


ROBOTICS 2

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.

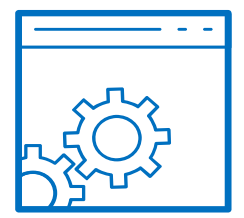
TO : Data models and algorithm decisions based.



DIGITAL TWIN 5

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

TO : Days or hours to find solutions.

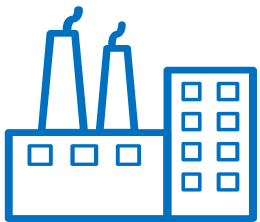


INDUSTRY 4.0 STREAMS IN DEVELOPMENT

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PROCESS CONTROL TOWER: CONCEPT IN DEVELOPMENT

CENTRALISED CONTROL ROOM WITH CCTV VISION



45

CONNECTED WORKER-HEADSETS

Take advantage of the 4.0 technology



CONNECTED WORKER

Take advantage of the 4.0 technologies



AUTOMATION HUMIDITY-CAN WEIGHT

Control System for BDS™
BULK DENSITY SYSTEM - BDS™

Product Moisture Example

- Moisture Sample Data - In-line moisture meter data
- Stabilising Moisture Could Allow for Finished Food Moisture Substitution
- Improved Throughput Rate
- Energy Savings

Wrexham PoC with IA

IIOT- SIEMENS APPROACH

Condition Monitoring Systems provide transparency of mechanical components across all industries

There is no machine without vibrations.

- But when do vibrations cause damage?
- And what level of damage?
- And at the machine's history break down?

SIEMENS

Business electronics manufacturing plant, GER

Customer value

- Operational transparency on the connected applications to enable operational optimization and predict asset performance, increasing asset availability or enabling operational flexibility.

Why Siemens?

- Ease of use, simple and quick installation and commissioning
- Cost-effective, Plug & play sensor solution and range of powerful IoT features, offers an investment
- Security, transparency to support data protection and business
- Interoperability, Secure integration of other IIoT in better hardware than the rest of the IIoT Service Provider

AUTOMATION-INFRARED SYSTEM

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

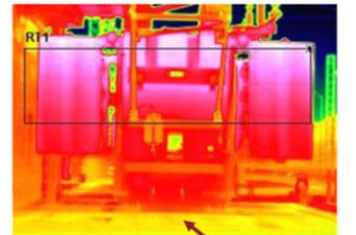
PROPOSED LOCATION OF JETZONE CAMERA POSITION

NOTE: Camera position allows for monitoring high temperature situations, not low temperature. There is high potential for obstruction by operators due to the operator walkway.

NOTE: These are proposed locations. Final locations need aligning through the KSUM Lead with input from the site functions (EHS, QHS, etc.)

NOTE: MOU to be located in close proximity to the camera. Opportunity exists to fit this on the existing platform support structure

TO PLC
TO PC

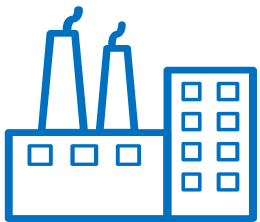


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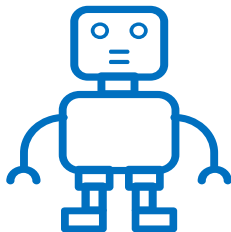


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FROM : High frequency manual tasks, ergonomic hazards.

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BAG-PACK LINE COBOT: PROOF OF CONCEPT



Before



After



Investment: 100K
Cobot to stack cases in pallet.

Output per shift doubled
Ergonomic improvement.

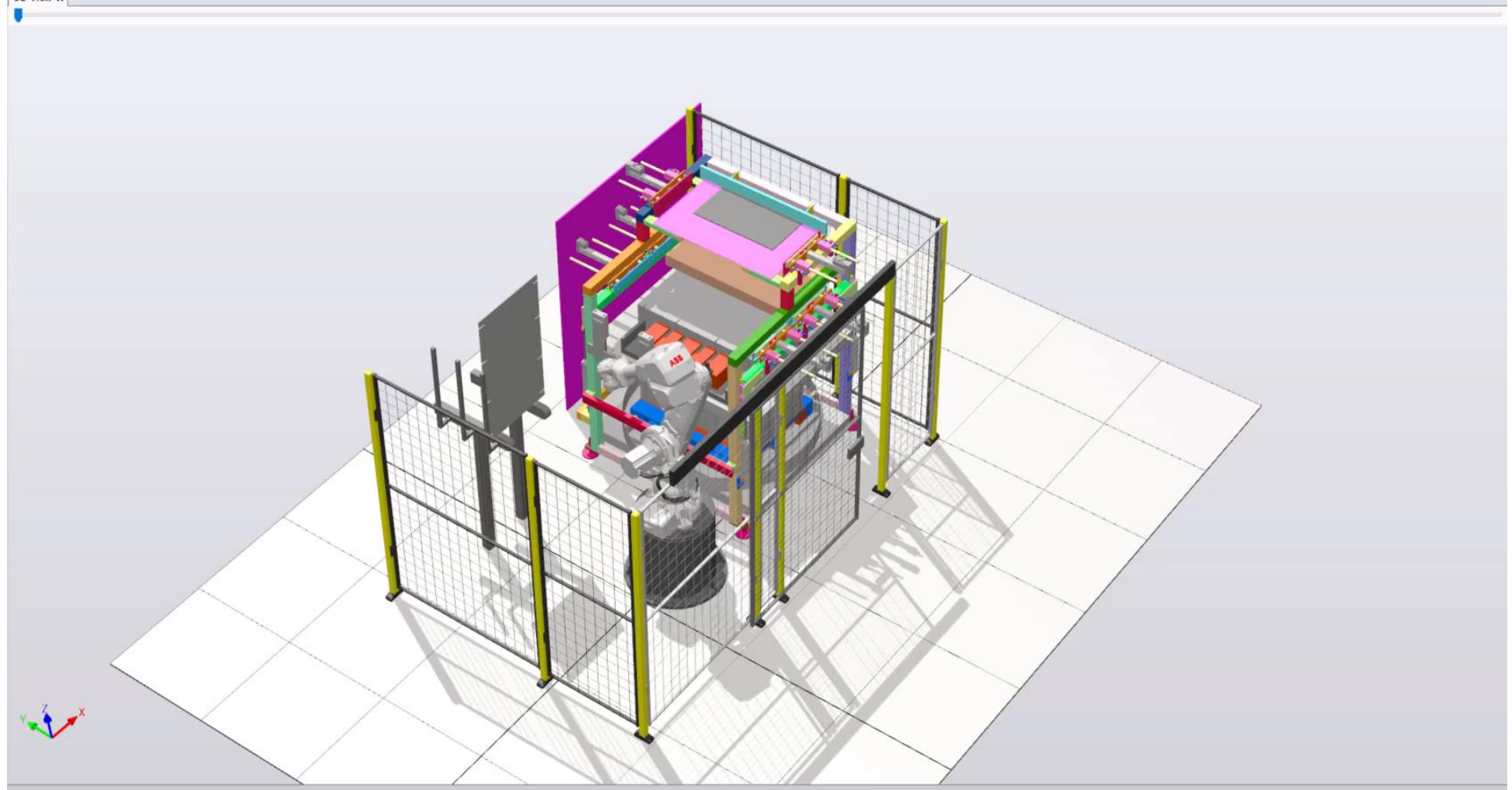
Savings 50k
IIR: 50%

| 20

SUCCESS



ROBOTS TO FEED CASES: FOUR PACKING LINES ROBOTS IN CONSTRUCTION

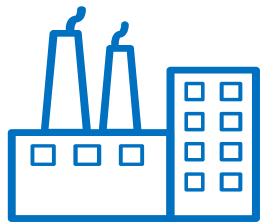


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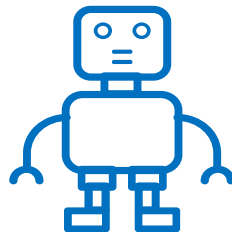


ROBOTICS 2

FROM : High frequency repetitive manual tasks, ergonomic hazards.

TO : Automate task to:

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LINE SUPPLY 3

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

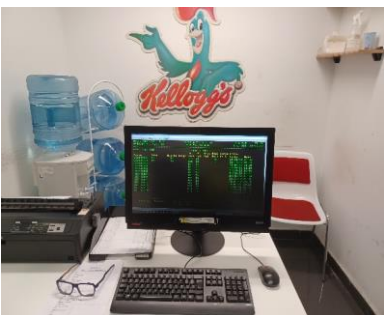
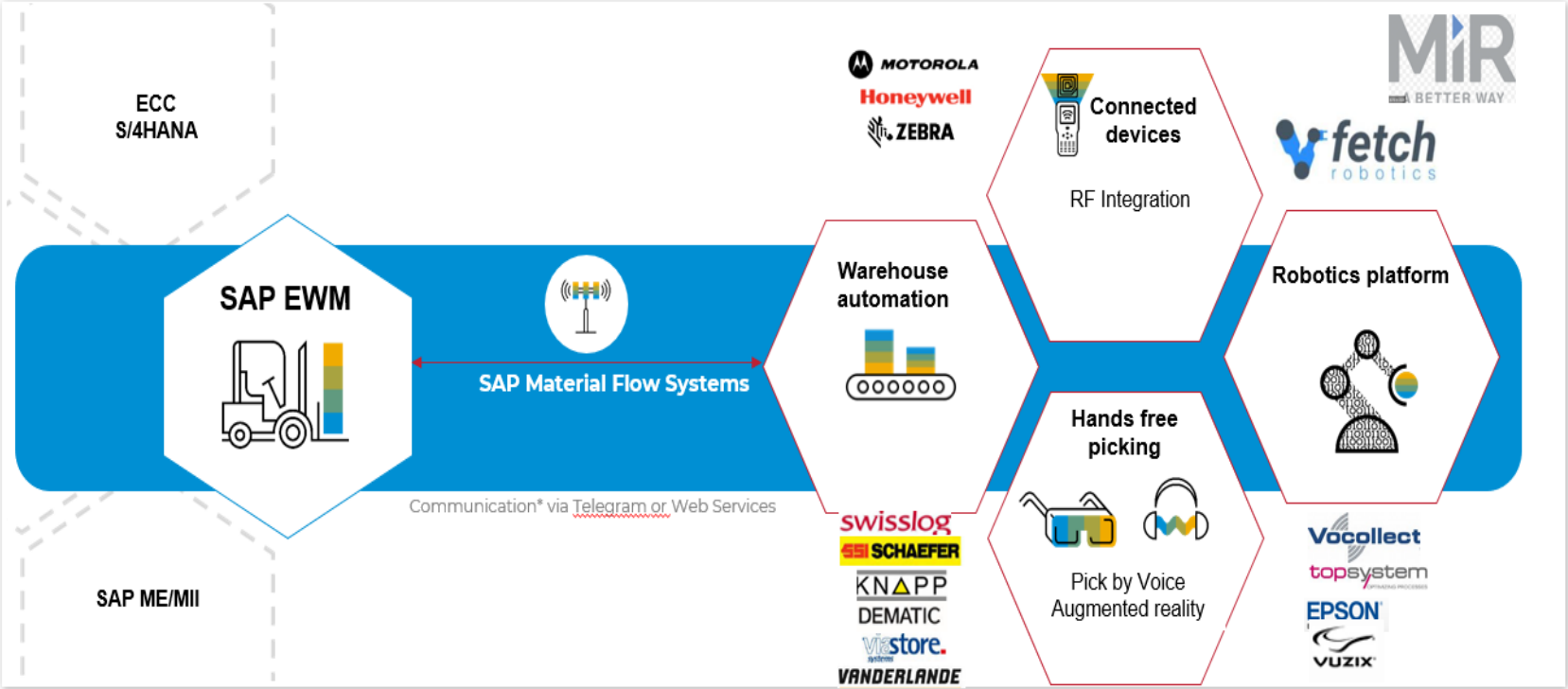
TO : Auto guided vehicles supplying material to the packing lines.



AUTONOMOUS LINE SUPPLY

Digital Core: **System of Record**

Digital Innovation: **System of Innovation**

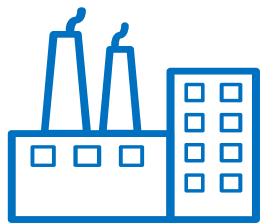


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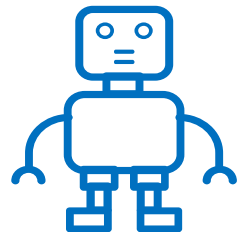
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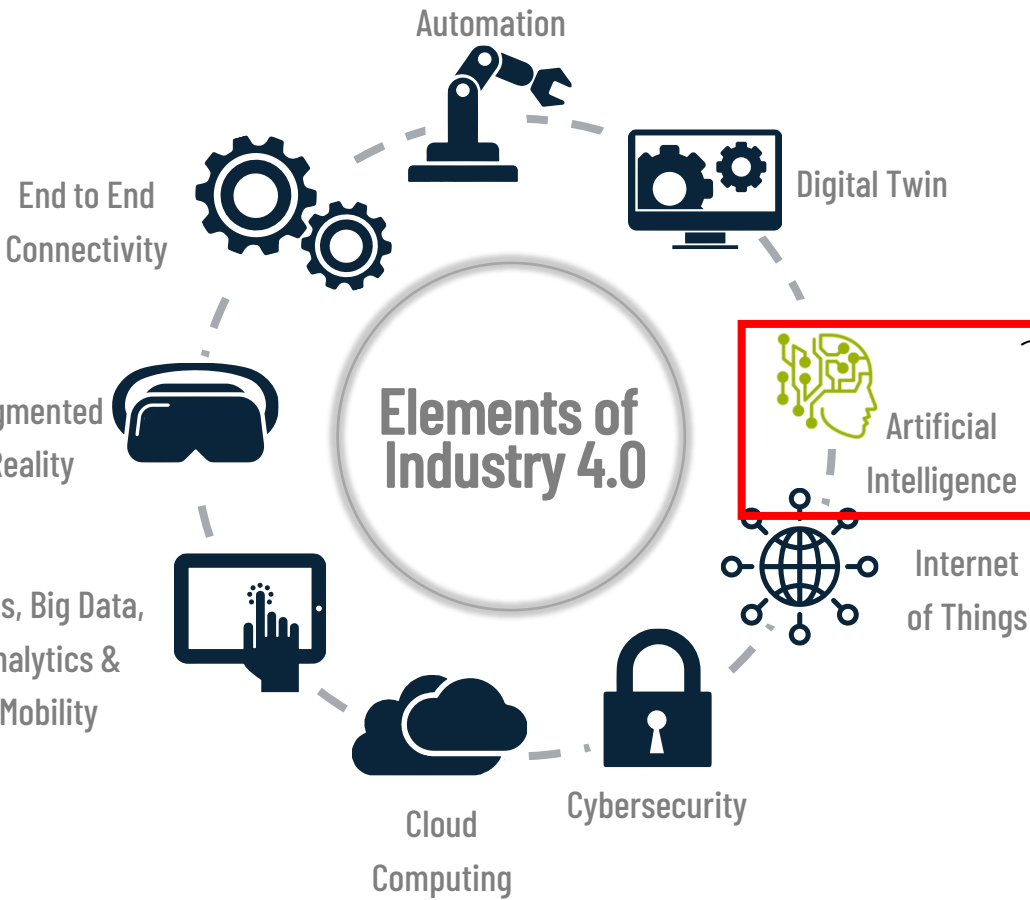
ARTIFICIAL INTELLIGENCE 4

FROM : Decisions based on intuition and operators experience.

TO : Data models and algorithm decisions based.



AI: EXTRUSION PILOT



PREDICTIVE CONTROL HOW?

Perfect Product



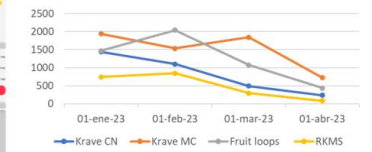
IDEAL RUNNING



IDEAL START UP



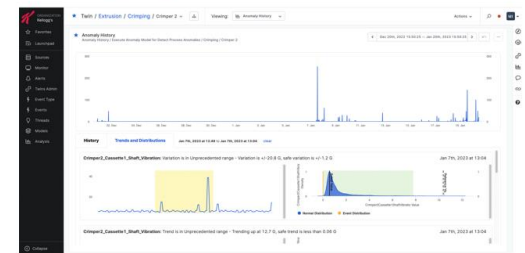
Ideal Startup conditions Waste reduction 2023



Pilot - Artificial Intelligence **TWINTHREAD**

PREDICTIVE ANALYTICS

Zero Breakdowns



Valls, What does it mean?



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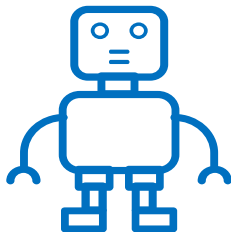


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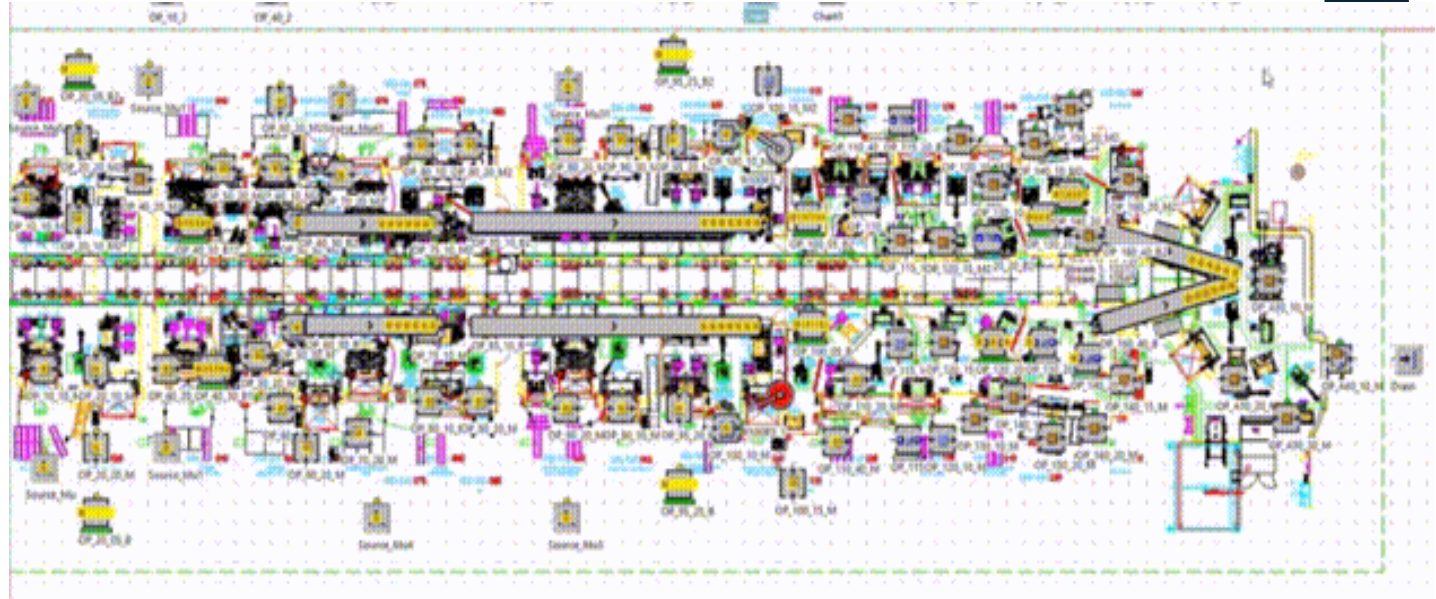
DIGITAL TWIN 5

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DIGITAL TWIN



Capacity Increase

Home > Siemens PLM Software > Tecnomatix > Products > Plant Simulation software

TECNOMATIX Plant Simulation

Model, simulate, visualize and analyze production systems and logistics processes to optimize material flow and resource utilization for all levels of your plant planning, from global facilities and local plants to specific production lines.

[Try now](#) [View fact sheet](#)

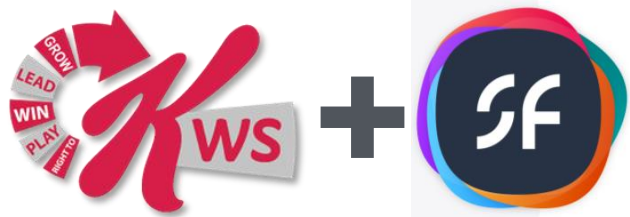
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Valls Plant Employee 4.0

VALLS PLANT EMPLOYEE 4.0



CHANGE MANAGEMENT

TRAINING/CAPABILITY PLAN

RECRUITMENT STRATEGIES

Kellogg's Employee 4.0

Preparing the Kellogg's Employee of the Future

The infographic shows a stylized human figure with various Industry 4.0 technologies connected to different parts of the body. The technologies include AGVs (Automated Guided Vehicles), Cobots/Robots, Drones, AR/VR (Augmented Reality/Virtual Reality), and 3D Printing. The figure is wearing a black cap with the Kellogg's logo. The background is white with red and blue accents.

AGVs

Cobots/Robots

Drones

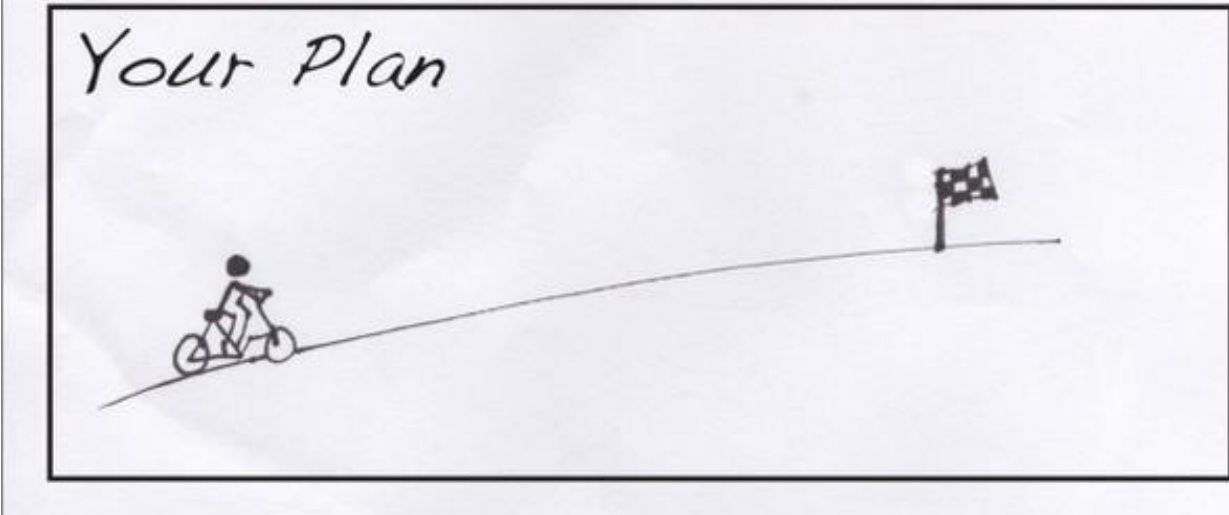
AR/VR

3D Printing

Industry 4.0

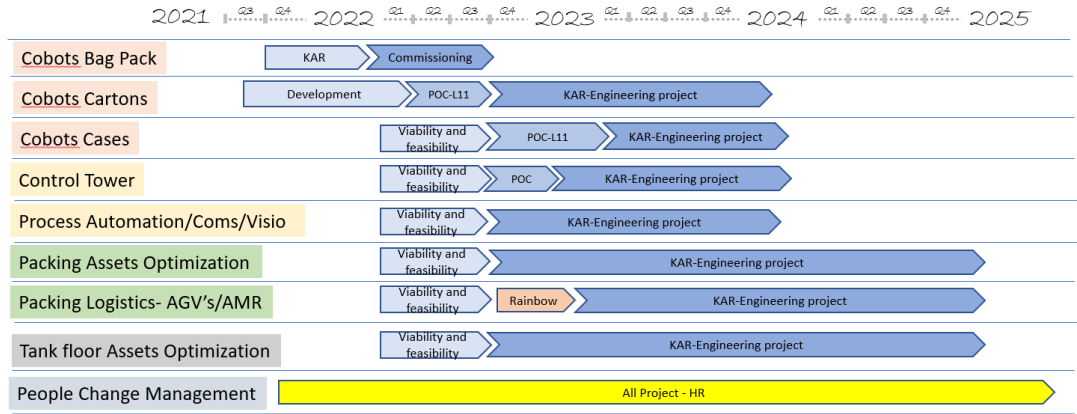
Kellogg's esade

VALLS 4.0 "NIMBLE LEARNING"



Timeline High level Valls 4.0

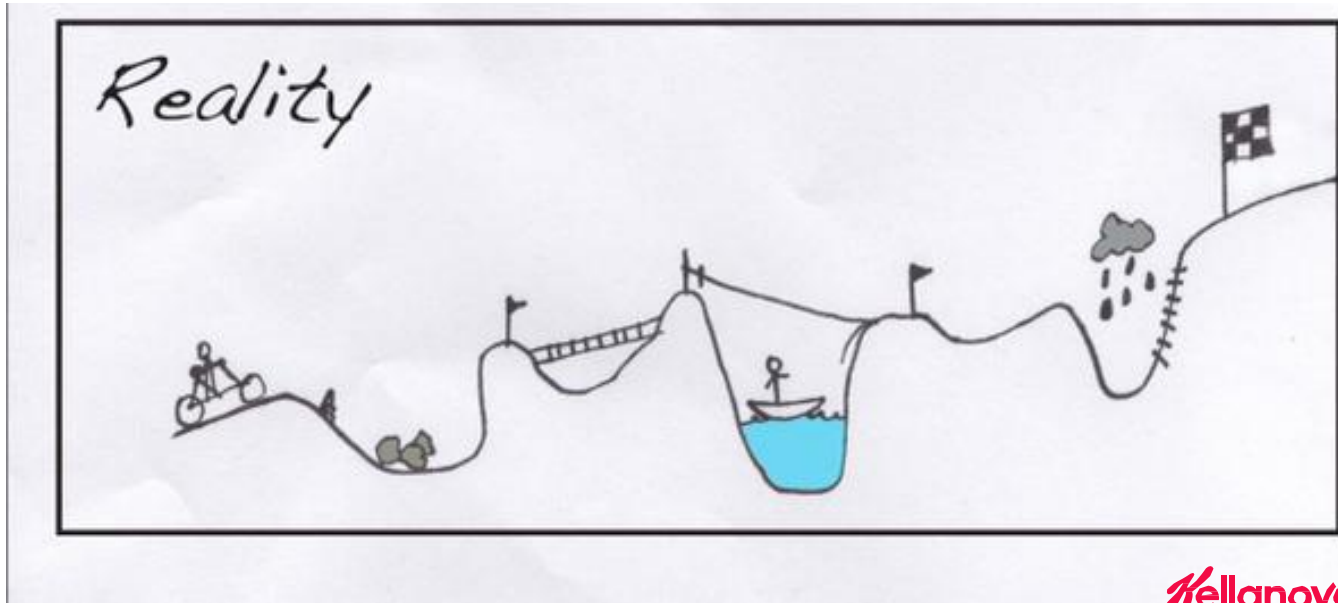
€ = OTC 100K Viability and feasibility



VALLS 4.0 MSR3

Owner: Emili Angles

Project	% Completed										Status	Tech Maturity Grade	Tech Feasibility	Complexity	Risk	Status	
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%							
1 Backpack Cobot	100%										Completed	High	High	High	High	High	Commissioned in Q1-2022
2 POC Feeding Cartons Cobot (200K€x7)	40%										In Progress	Medium	Medium	Medium	Medium	Medium	Further development needed
3 Feeding Cases Cobot (150K€ X 7)	30%										In Progress	Medium	Medium	Medium	Medium	Medium	Further development needed
4 Control Tower & Automation (Head sets/AI Cameras/Humidity Sensors)	50%										In Progress	Medium	Medium	Medium	Medium	Medium	Pilot: Productivity KAR Launched
5 Packing Asset Optimization	20%										In Progress	Medium	Medium	Medium	Medium	Medium	High cost - Low IRR
6 Packing logistics Automation	10%										In Progress	Medium	Medium	Medium	Medium	Medium	Engineering project launched
7 Tank Floor Assets Optimization	10%										In Progress	Medium	Medium	Medium	Medium	Medium	High cost - Low IRR
8 People Change Management	10%										In Progress	Medium	Medium	Medium	Medium	Medium	Change Management started Tank Floor Control Tower



EMILI

Spain





Emilio Angles Isern [Get verified](#)

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

Talks about #industry40 and #digitaltransformation

Reus, Catalonia, Spain · [Contact info](#)

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