



# Industry 4.0 on waste management

Automation, data analytics, robotics

October 27th, 2022

**David Marcouiller,**  
Executive Vice-President Sales Engineering

# What to Expect:

1. MACHINEX & RE.GROUP – WHO WE ARE
2. OUR COMMITMENT TO TECHNOLOGIES
3. INDUSTRY 4.0 & HISTORY
4. FUTURE VISION
5. TODAY'S APP
6. Q&A



# WHO WE ARE

...QUICK OVERVIEW



**M**  
**MACHINEX**



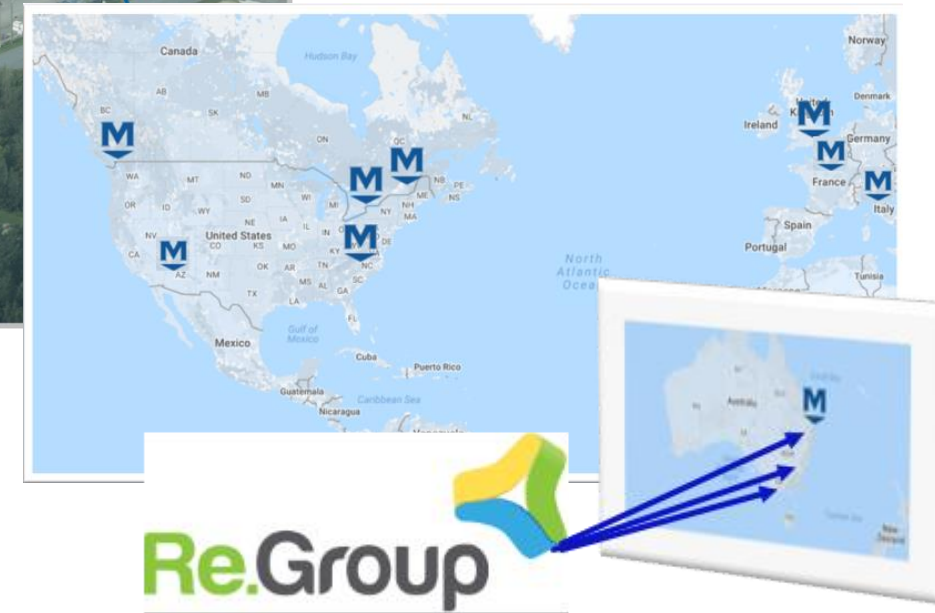
# MACHINEX CAMPUS – QUÉBEC / CANADA



Celebrated our 50<sup>th</sup> in 2020...



Plessisville,  
Québec, Canada



- ▶ Over 550 teammates working towards our mission.
- ▶ Single site campus or over 30 acres.
- ▶ and over with 18,000 square meters or factory buildings.



# INTERNATIONAL PRESENCE







# OUR COMMITMENTS

...AND WHY

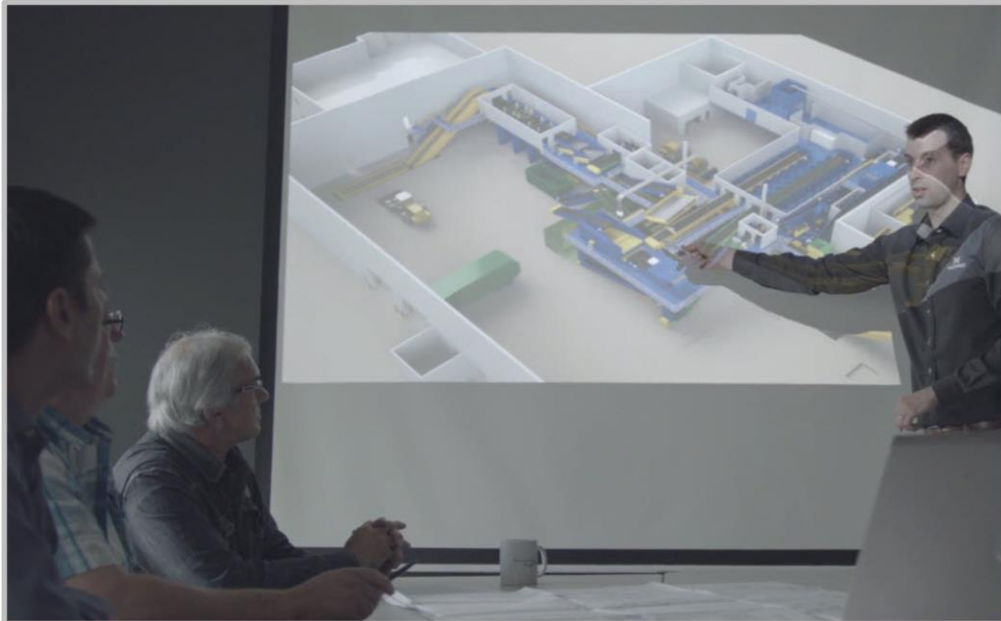


**M**  
**MACHINEX**

# OUR MISSION



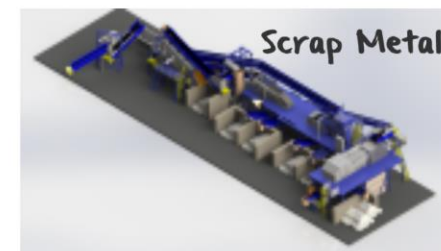
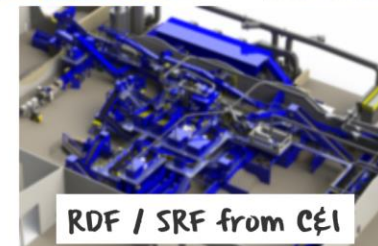
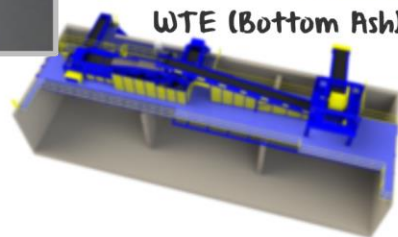
...Create Solutions for a Sustainable Tomorrow.



- ▶ TERRITORY SALES
- ▶ SALES ENGINEERS
- ▶ SAFETY STAFF (Dedicated)
- ▶ PROJECT MANAGERS
- ▶ MANUFACTURING
- ▶ SERVICE AFTER SALE



ACTIVE IN CANADA / USA / EUROPE / AUSTRALIA





# OUR COMMITMENT TO TECHNOLOGIES



## VISION:

- ▶ GEARED TOWARDS THE MRF OF THE FUTURE
- ▶ TECHNO-HUB
- ▶ HI-TECH SHOP EXPANSION (7,000 sq.meters.)







# INDUSTRY 4.0...

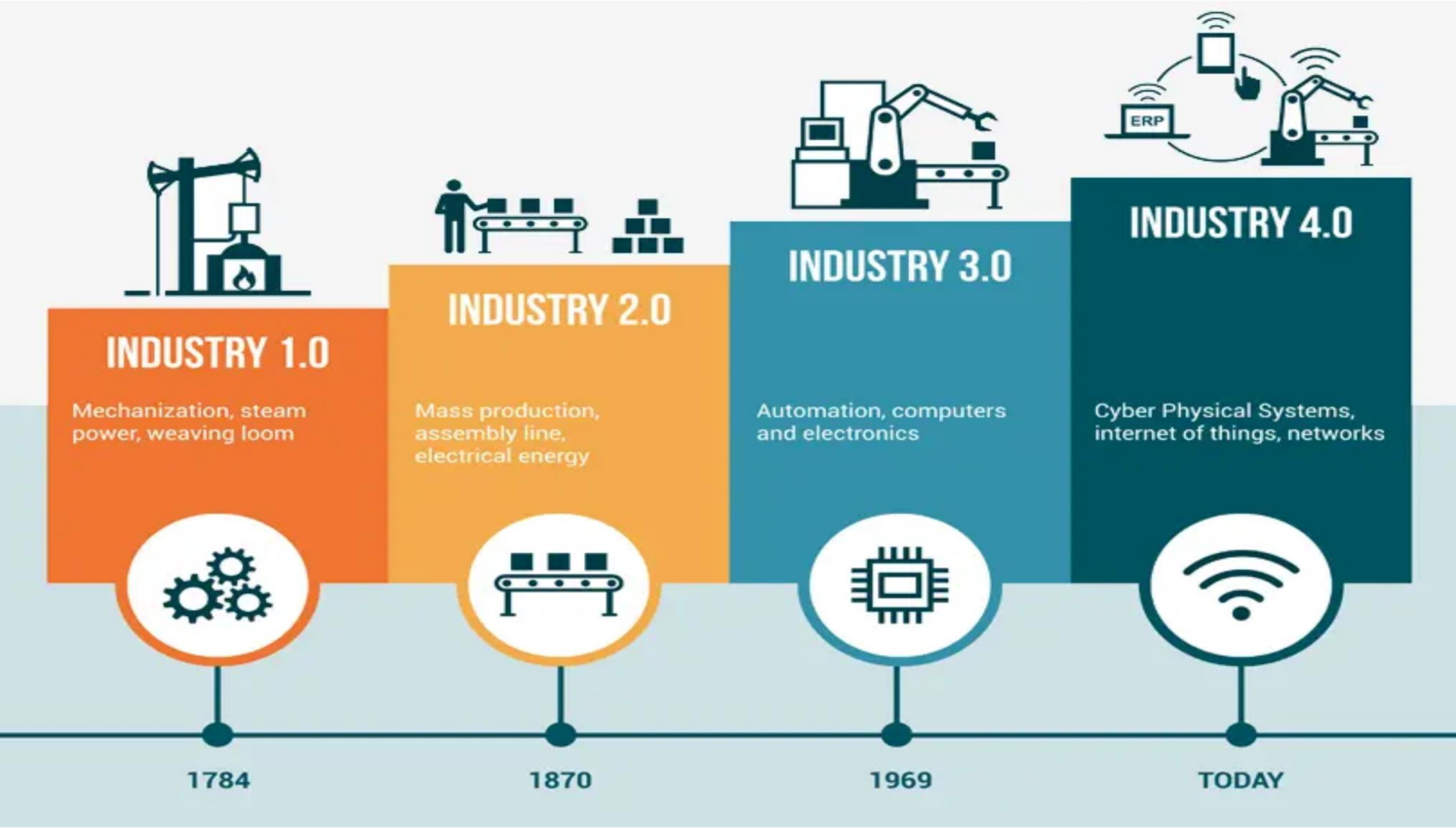
...MEANING



**M**  
**MACHINEX**

# 4.0 – WHAT IT MEANS HERE.

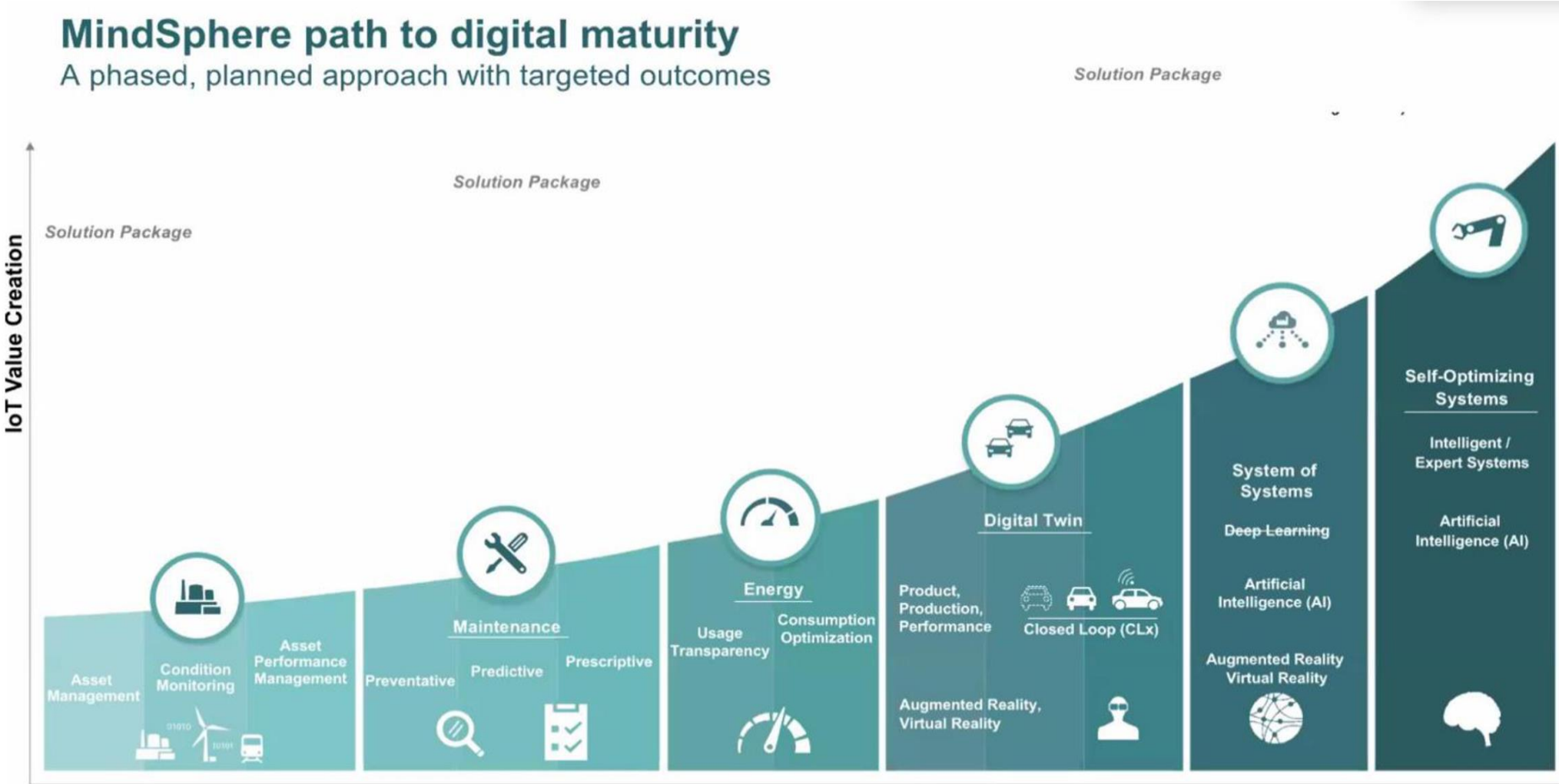
# M





## MindSphere path to digital maturity

A phased, planned approach with targeted outcomes



## SORTING TECHNOLOGY EVOLUTION

2010-2022



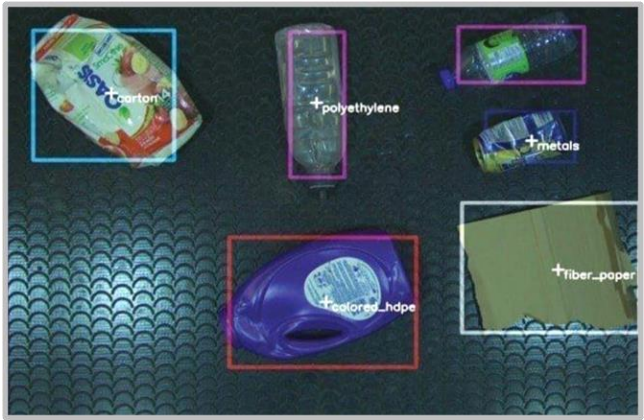
Balers



Optical sorters



Sorting robots



AI





# FUTURE VISION...

...and the future is now



**M**  
**MACHINEX**

## UTLIMATE GOAL: 24/7 FACTORY OPERATION WITHOUT MANUAL SORTING OR HANDLING

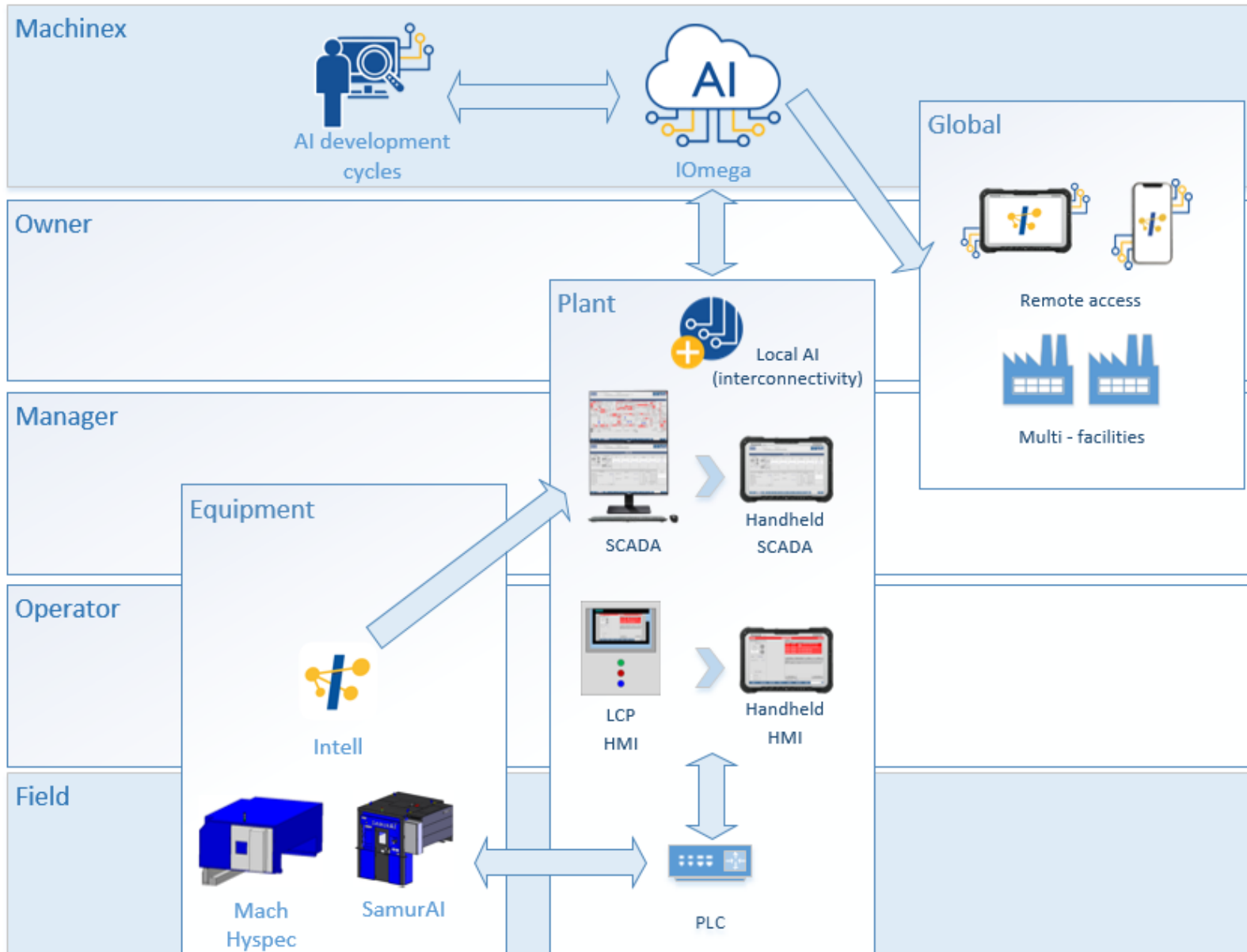
### Full automated plant requiring little labor

- Interconnectivity and automatic plant adjustments
- Analysis of data flow and system performance
- Predictive maintenance for upkeep and breakdowns.
- Brands and logo recognition.
- Automation of manual operations (including pre-sorting, bales management and incoming materials, etc...)
- Temporary buffer zones to regulate equipment's tonnage





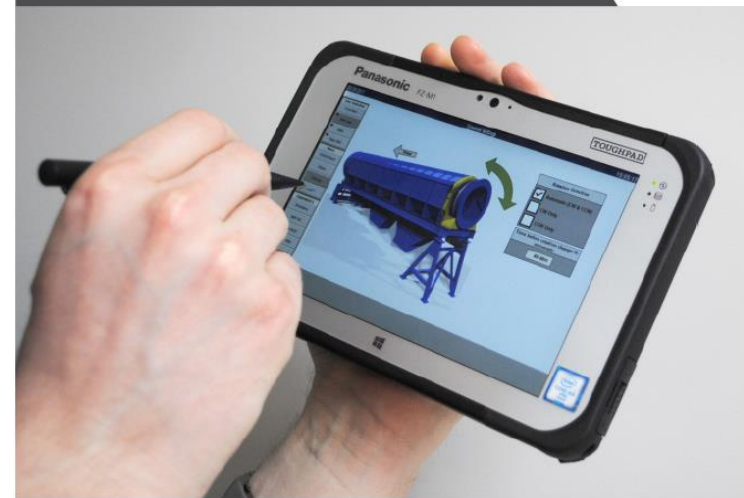
# MRF 4.0 – AT DIFFERENT STAGE



## FULL SCADA SYSTEM

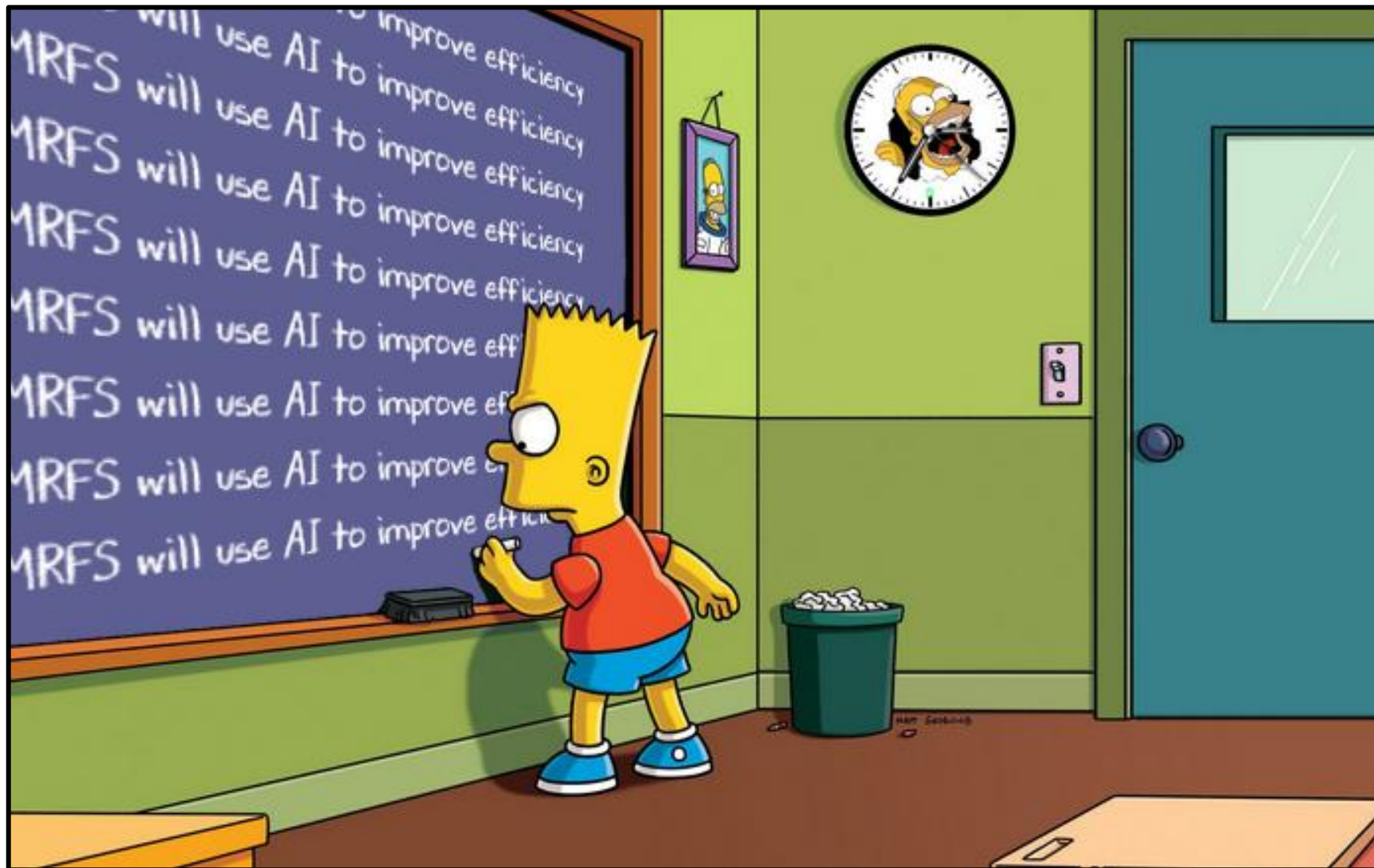


## MACH PAD CONTROL



# WHO WOULD HAVE THOUGHT?

M





▶ **TODAY'S APP...**  
...in real life

**M**  
**MACHINEX**







**COMPOSITION OF INPUT MATERIALS**

## BELT COVER







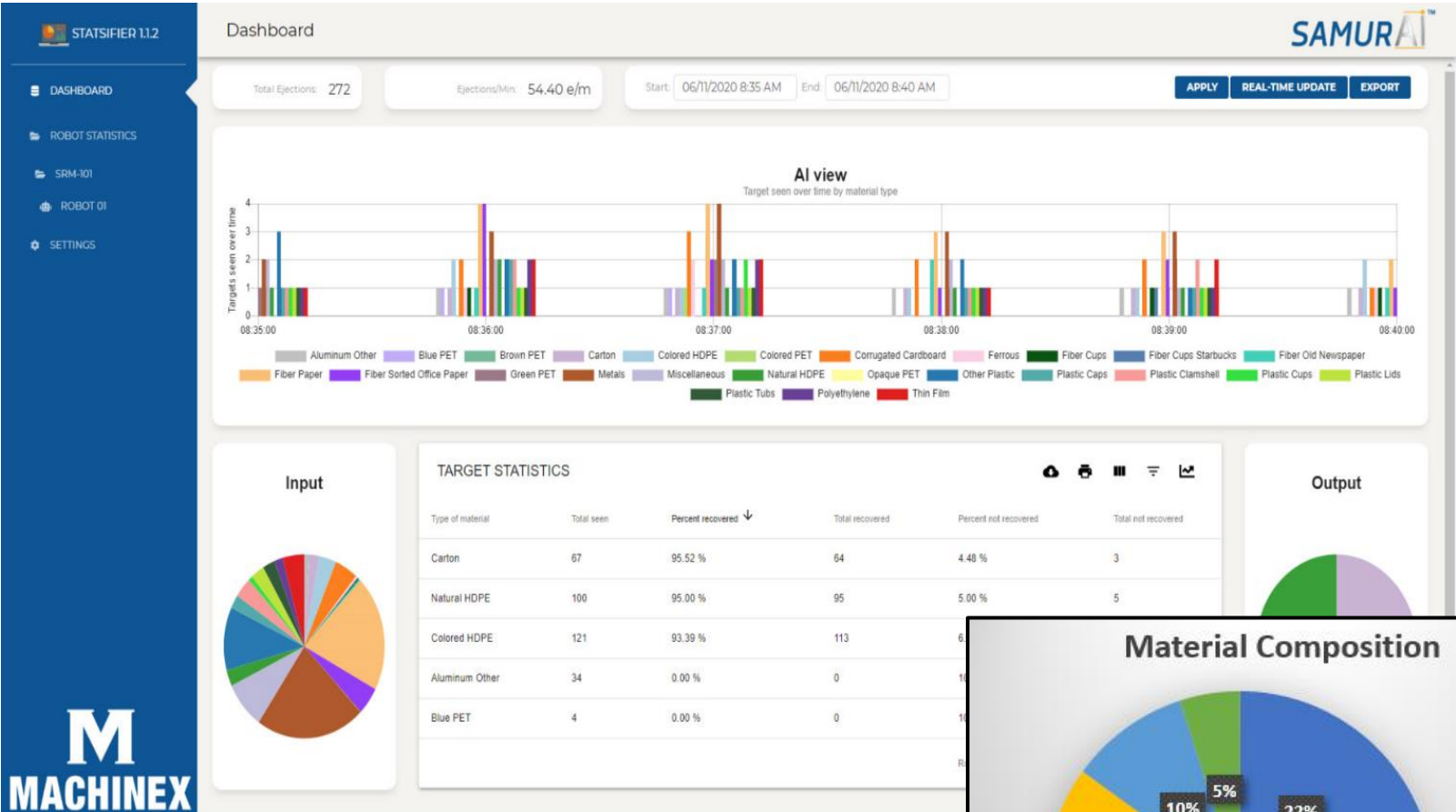
# SORTING ROBOT VS. MANUAL LABOUR

# M

# SAMURAI<sup>®</sup>

- **Reduced labor, managing costs & HR challenges**
- **Up to 70-80 picks per minute**, nearly double the average pick rate of a human sorter
- **Up to 90-95% efficiency** of targeted products recognition & recovery
- **Ongoing evolution & optimization** of the AI material recognition





## INFORMATION CAPTURED

- Incoming material composition
- Outgoing material composition (in cells)
- Robots performance (pick/min, % recovery, etc.)



UNDERSTAND YOUR MATERIAL  
STREAM COMPOSITION  
IN REAL TIME



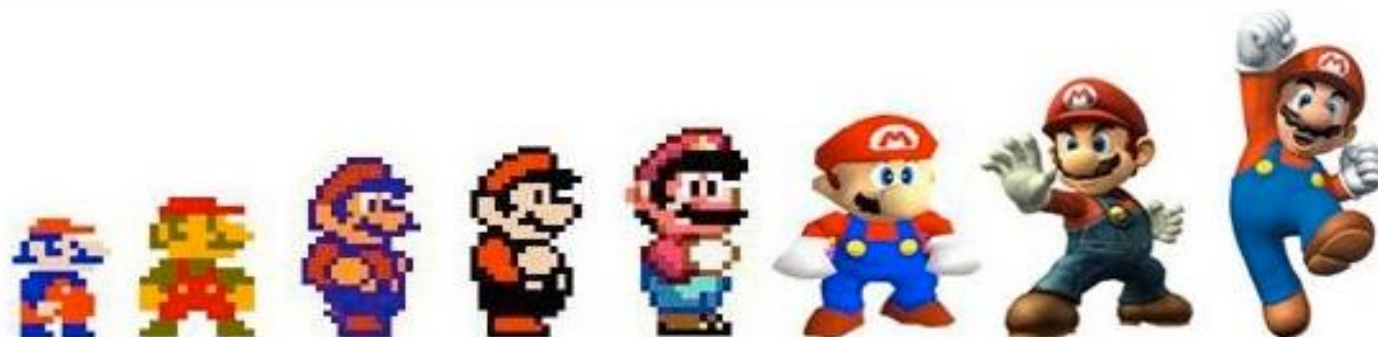
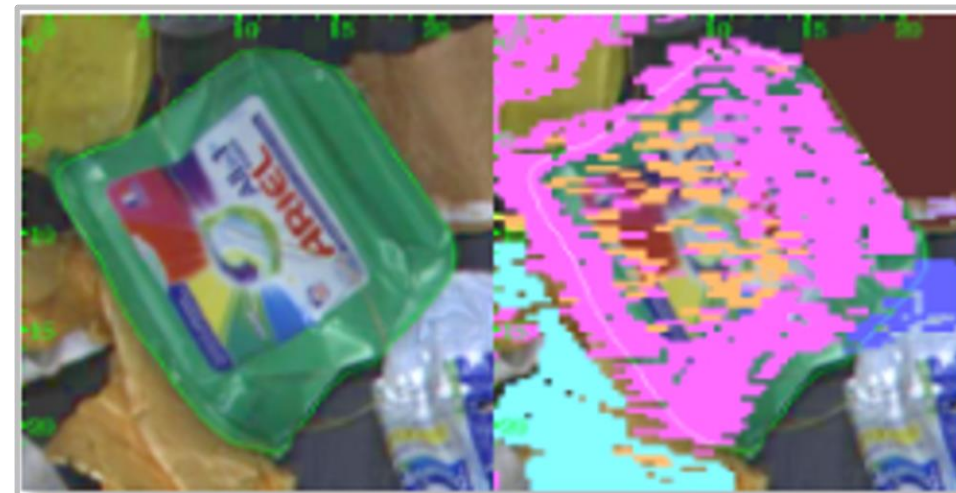


# COMBINATION OF SIGNALS



## MACH HYSPEC® (VIS/NIR + IA)

4 TYPES OF TECHNOLOGY COMBINED TO  
OBTAIN INCREASED PERFORMANCE

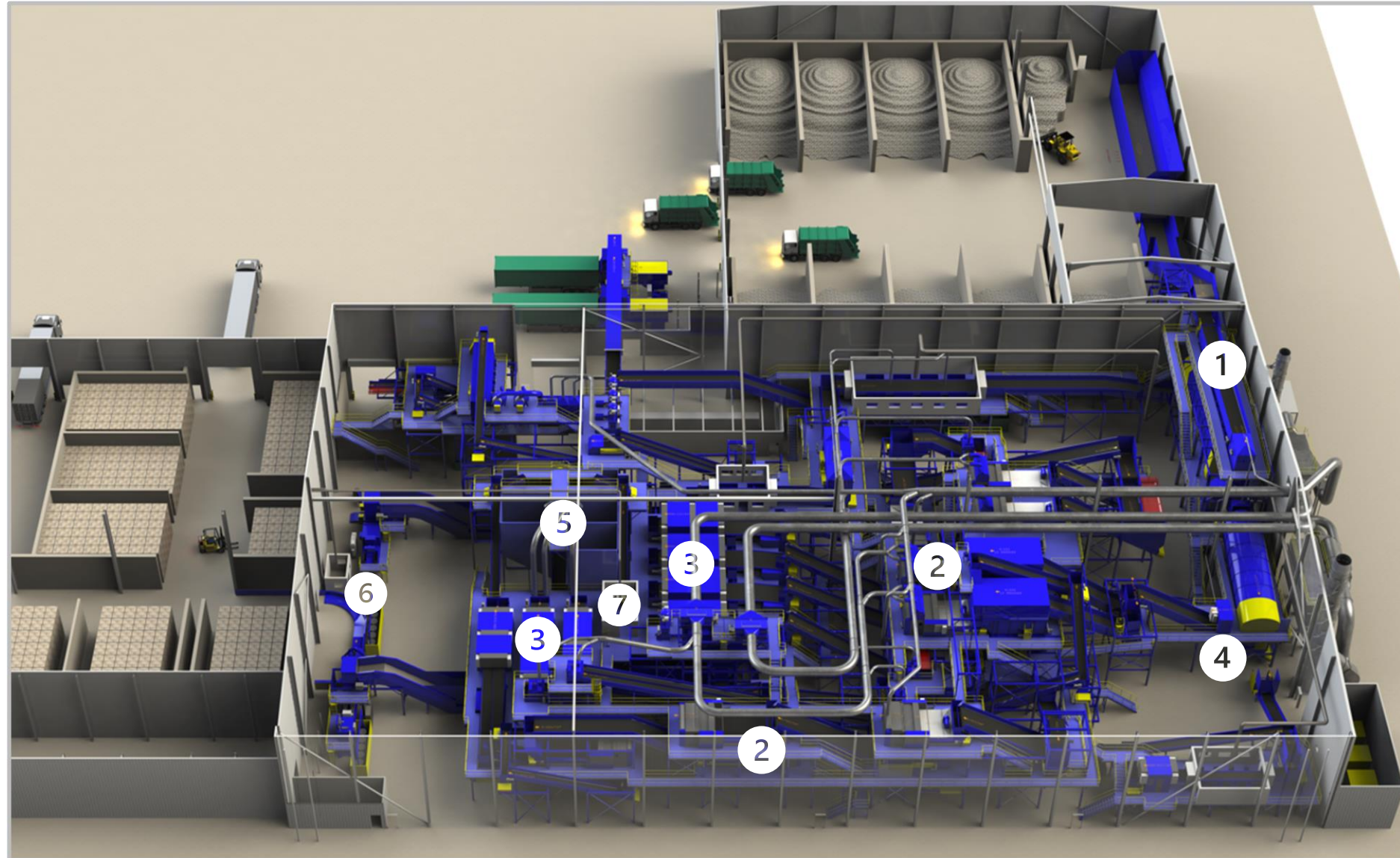


- Artificial intelligence integrated in optics:
  - **Deep learning** (image recognition)
  - **Machine Learning** (material recognition)

# WHERE / HOW TO CAPTURE INFORMATION?



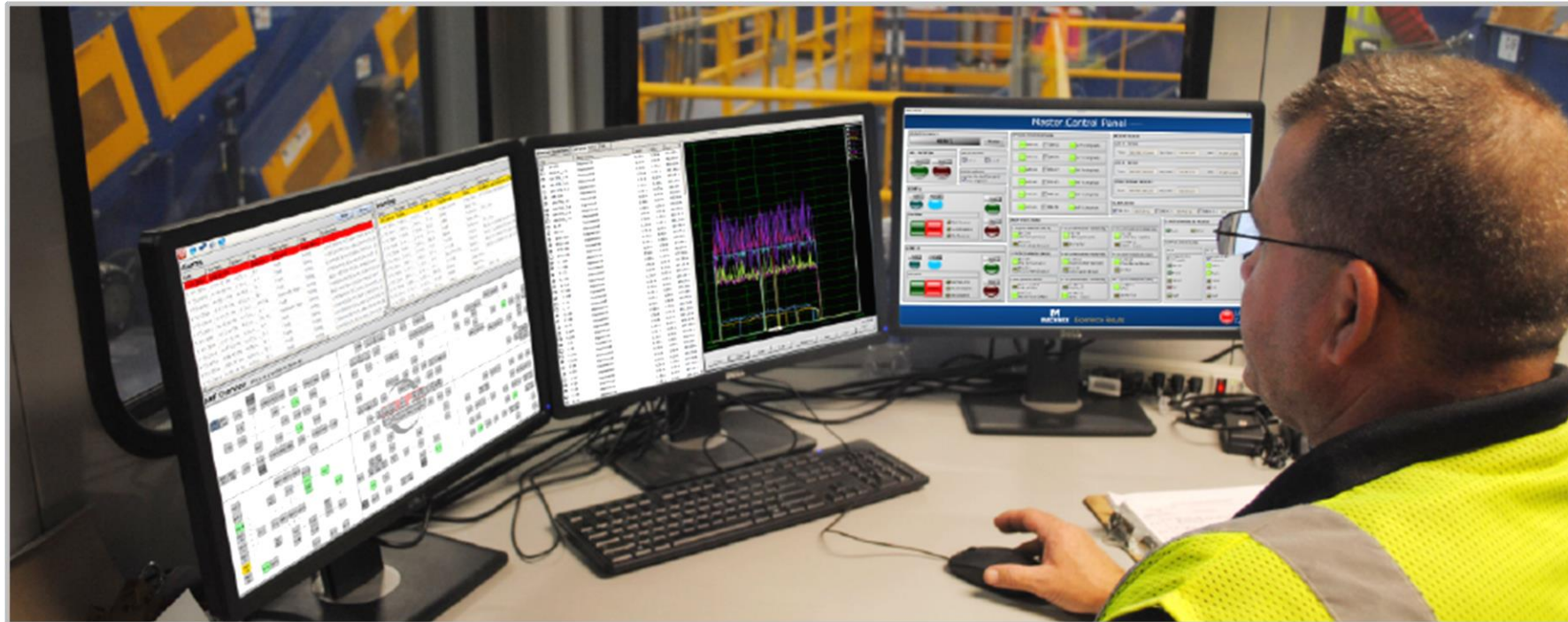
- 1) SCALE
- 2) HYSPEC INTELL
- 3) SAMURAI INTELL
- 4) MACH VISION
- 5) STORAGE CELLS
- 6) BALES MANAGEMENT
- 7) SCADA





## OBJECTIFS DU SCADA

- Gather all information captured by different platforms
- Generate dynamic information (power monitoring, equipment status, belt speed, etc.)
- Generate production reports
- Generate alarms and be the cornerstone of machine control



# WHAT TO DO WITH THE INFORMATION?

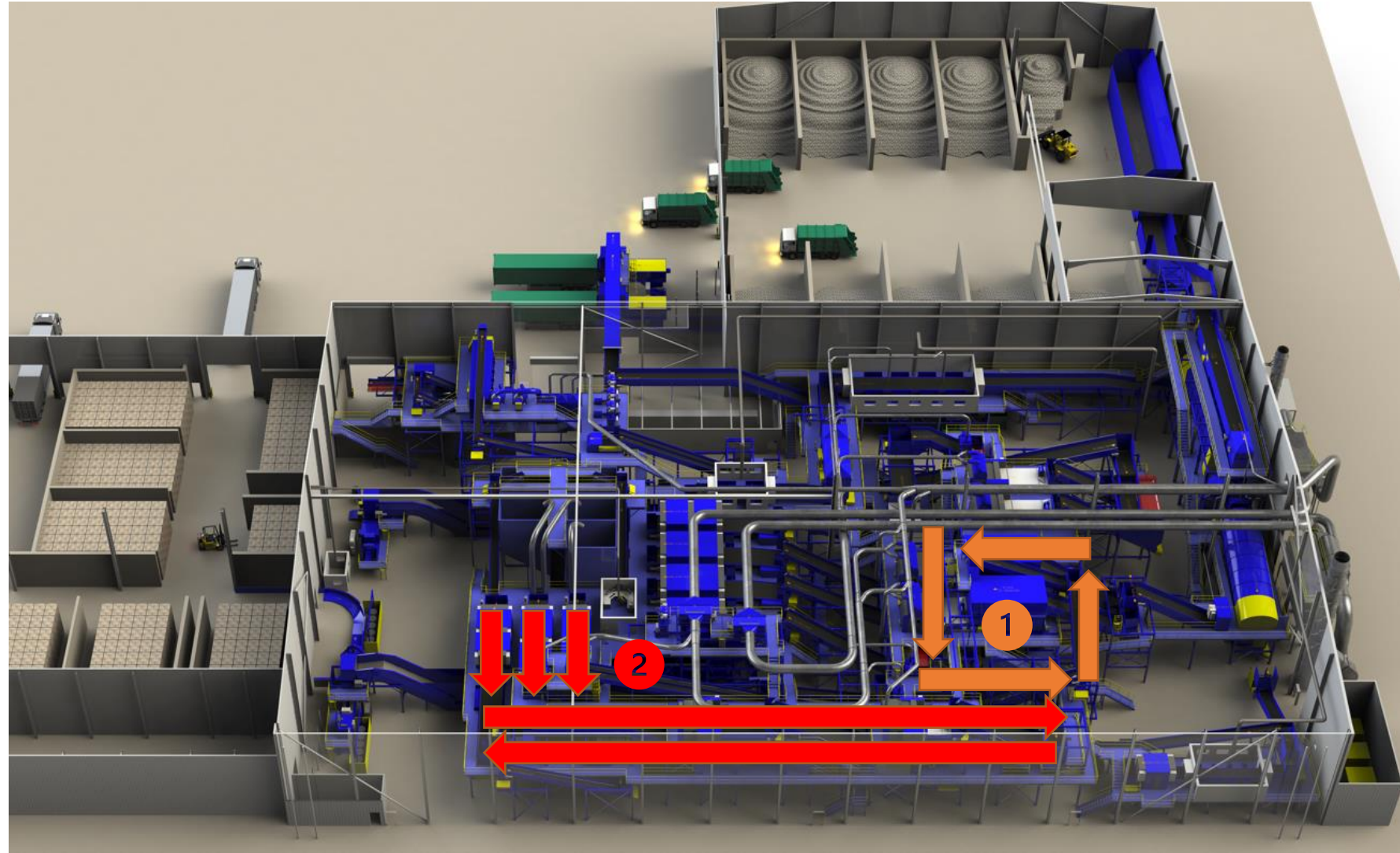


## MACHINE CONTROL/SERVOING? (3 DEVELOPMENT PHASES)

- **Phase #1** = Decision support/alarms
- **Phase #2** = Automation programming (local AI)
- **Phase #3** = AI machine control (IOmega)

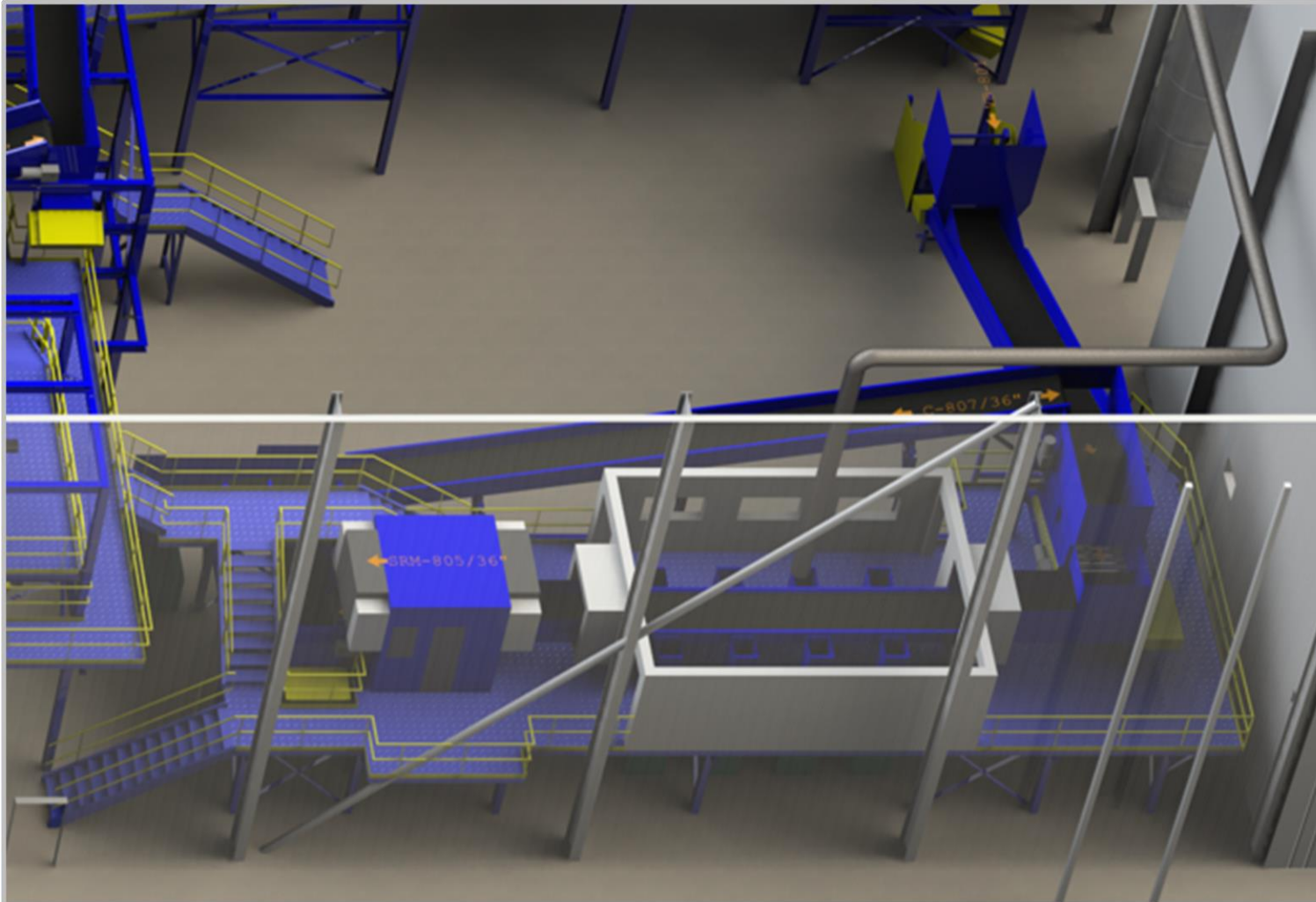
## AUTOMATION OF THE 2 RECIRCULATION LOOPS

- **#1** = Fiber loop
- **#2** = Containers loops





## Automation of Sampling Lines



# WHY INVEST AND BELIEVE IN 4.0



## CHANGES IN STRATEGIES

- Extended deposit/ REP / New outlets

## COMPOSITION CHANGES

- Amazon effect / COVID-19 / new packaging
- HIGHER - Quality requirements and diversion goals

## LACK OF LABOR

- Job positions difficult to fill

## CONSTANCY OF PRODUCTION

- Outgoing quality and recovery rates optimized & stable over time
- Less expertise required to optimize MRF operation
- Better predictability of required maintenance







# Q&A

...and open discussions



**THANK YOU**

[dmarcouiller@machinex.ca](mailto:dmarcouiller@machinex.ca)

FOLLOW US:

