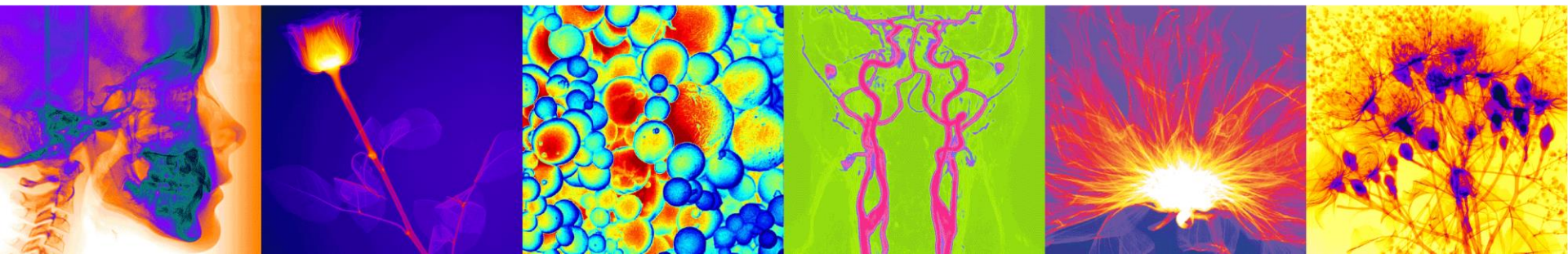


# «Digital transformation of Pharma and API Plants: a way to create value for long term sustainability »

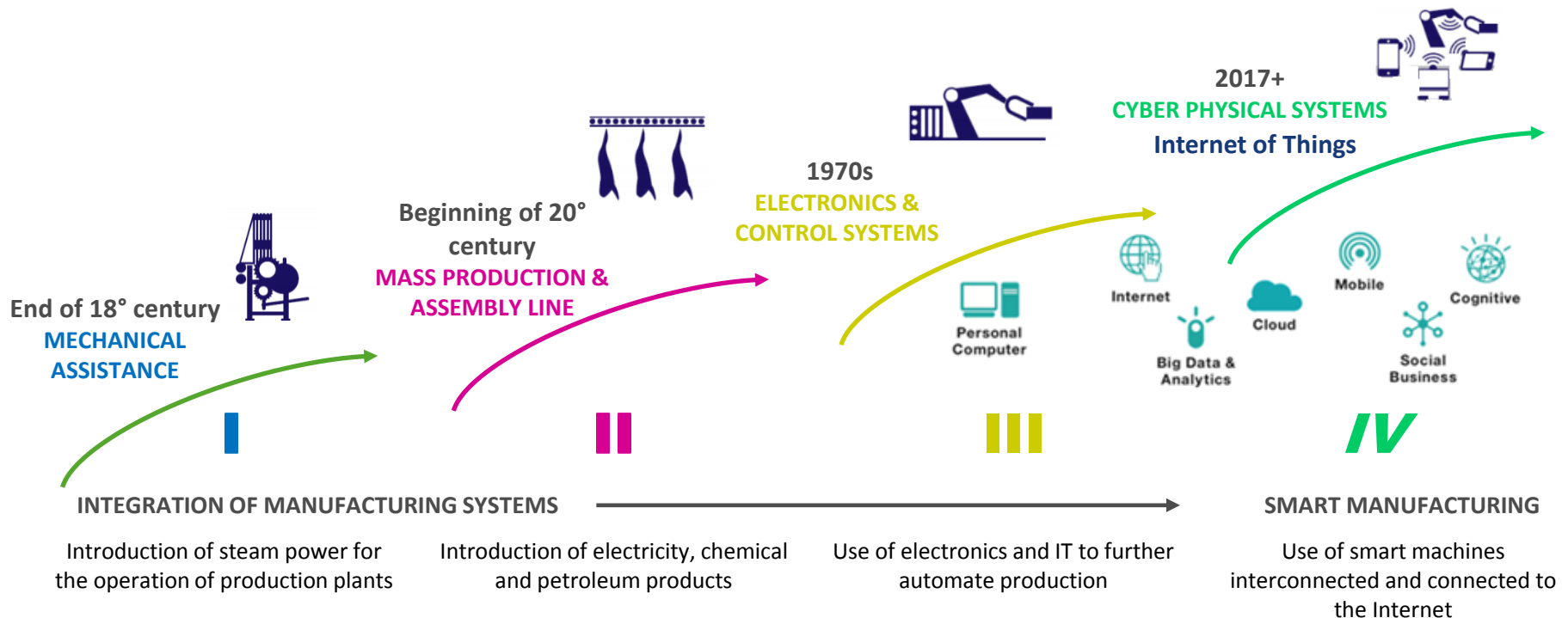
G. Burba

**Chemistry 4.0**

Milan, September 27<sup>th</sup>, 2018



# The 4<sup>th</sup> industrial revolution



# The right first question

The right first question is not:

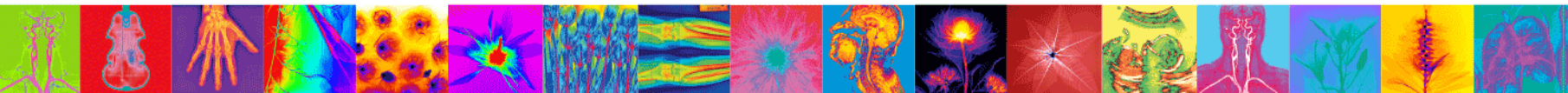
**What** is the right technology to apply?

Or

**How** can I implement it?

But.....

**Why** do I apply it in Operations?



# Creating Value for a long term Sustainability



Improving:

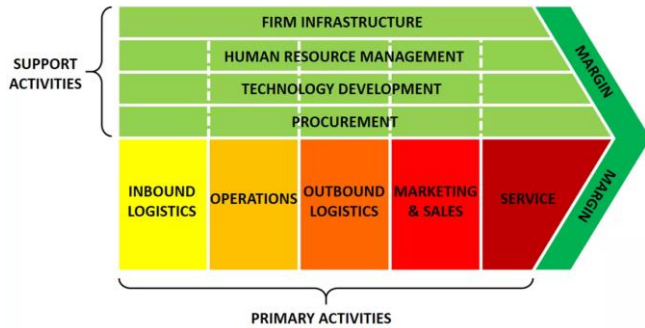
- Overall efficiency
- Quality
- Health, Safety and Environment



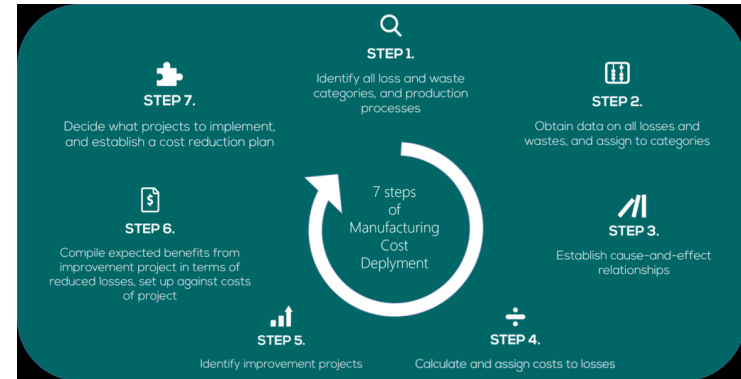


# 1 Step: Value Analysis

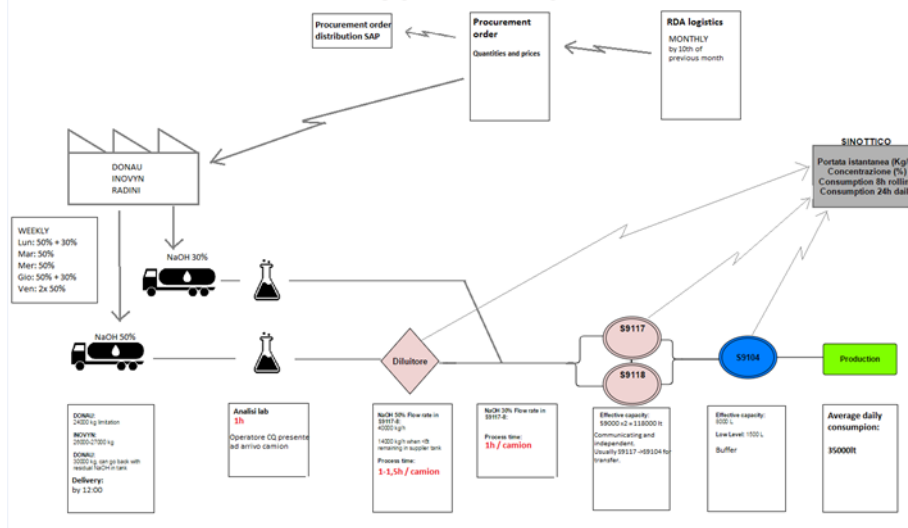
## Value Chain



## Cost Deployment

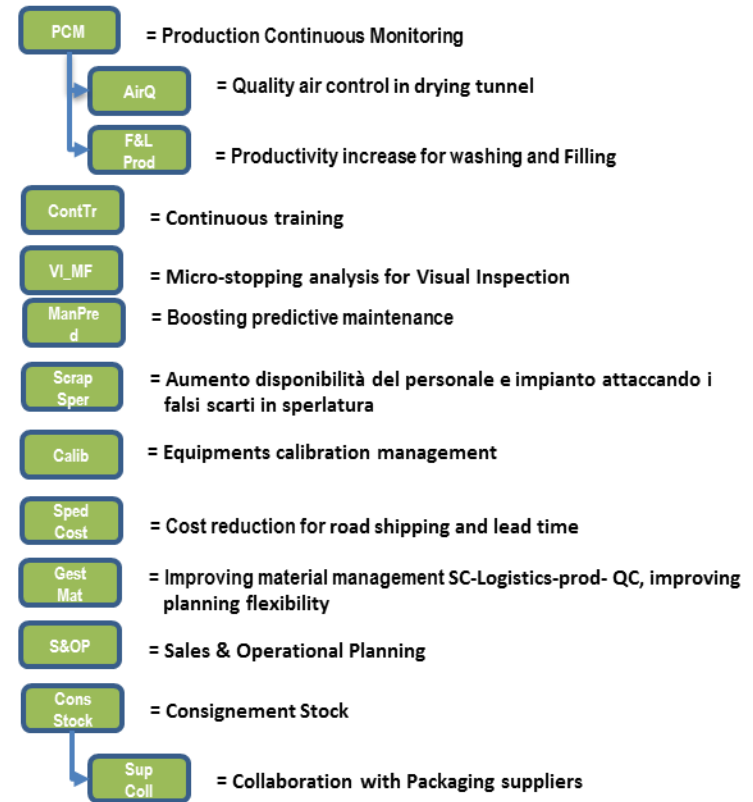
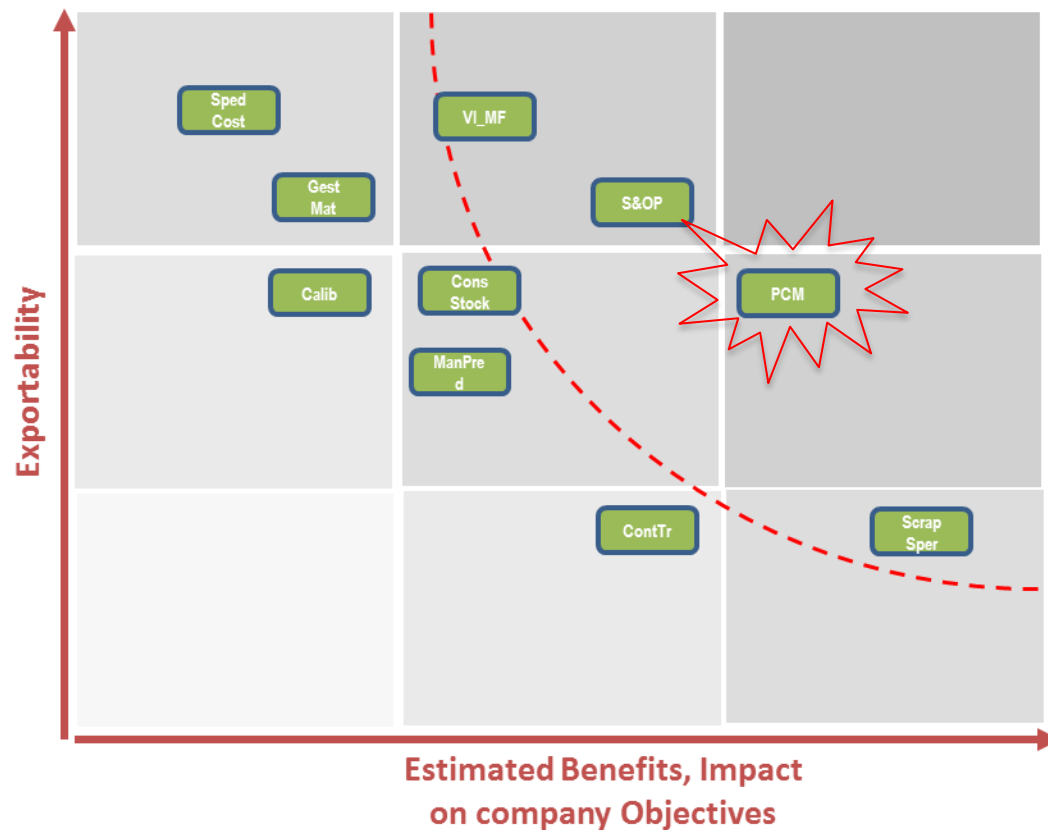


## VSM to identify process steps and wastes



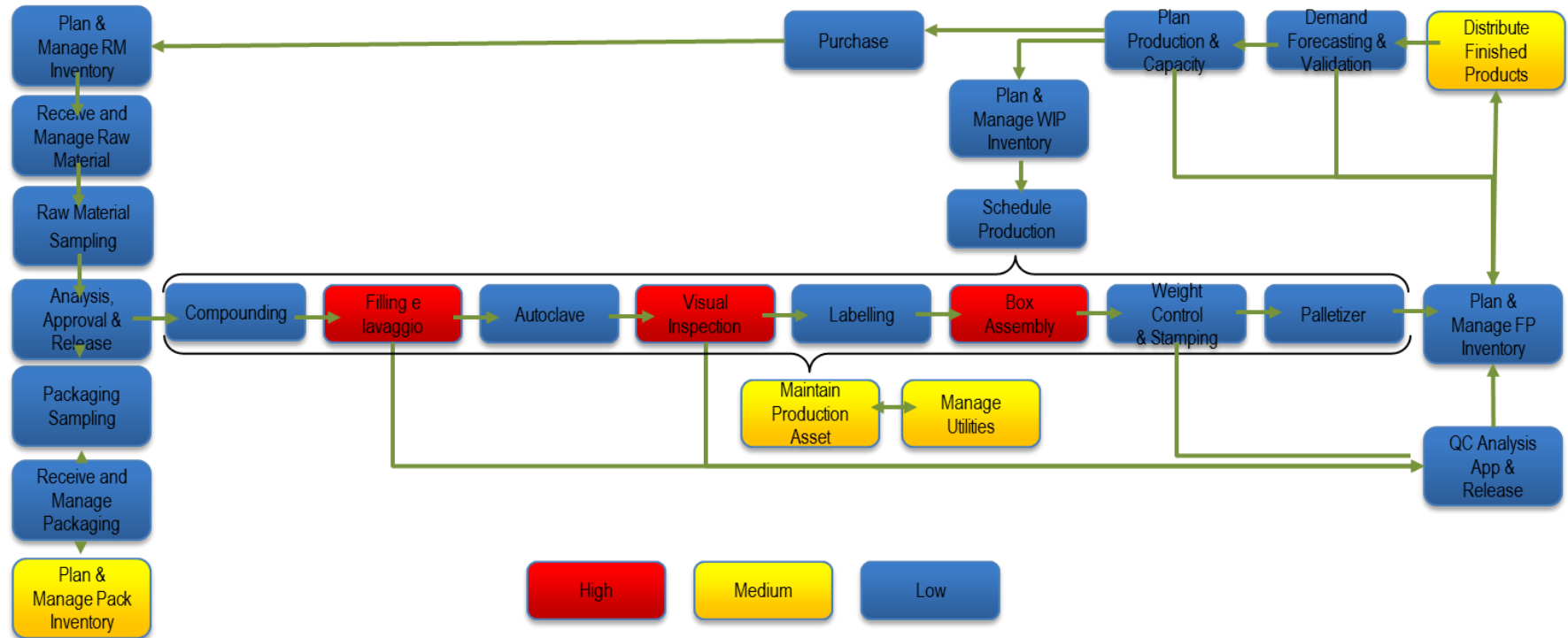
# PCM Project: Transformation Case

## Prioritization Matrix



# Production Continuous Monitoring Business Value Assessment

PCM project start-up stemmed from a business value assessment that highlighted the main business needs for our plant – **Value Stream Analysis**



# PCM Project Scope

## PCM - Production Continuous Monitoring ProHance® syringe line, Colleretto BioIndustry Park

Washing  
machine

Filling  
machine

Visual  
Inspection

As part of I4.0 PCM project, we included three machines belonging to the ProHance® Production line:



Washing machine



Filling machine



Visual inspection

These machines

- Do not communicate each other **Do not «talk» together**
- Have an own monitoring panel that let users access production data





# From theory to practice

## What we had:



Production line  
Process Knowledge



Data from sensors



People

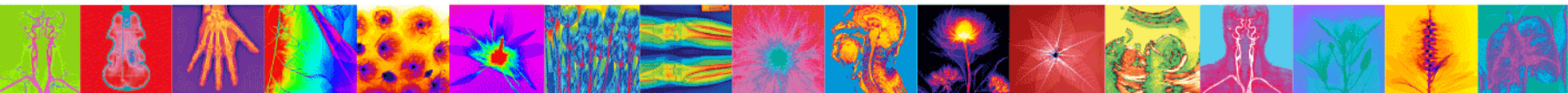
## What we needed:



infrastructure



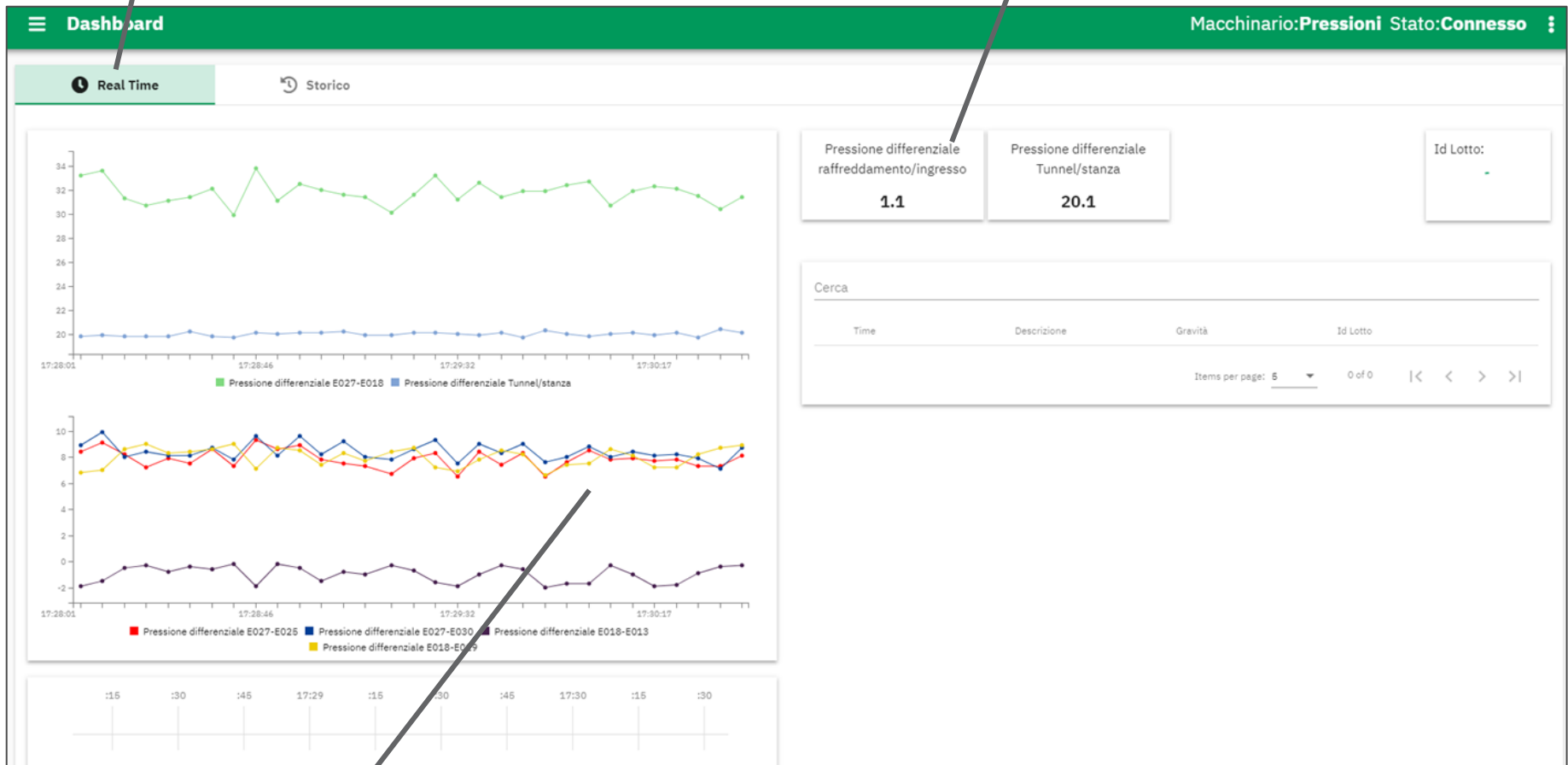
Cloud platform



# Dashboard view: Example 1

Real-time vs Historical  
view switch

Real-time  
parameter values



Continuous  
data plots



# Dashboard view: Example 2

## PCM - Production Continuous Monitoring ProHance® Syringes line, Colletterto BioIndustry Park

Washing  
machine

Filling  
machine

Visual  
Inspection

Real-time vs Historical  
view switch

Machine name and  
status

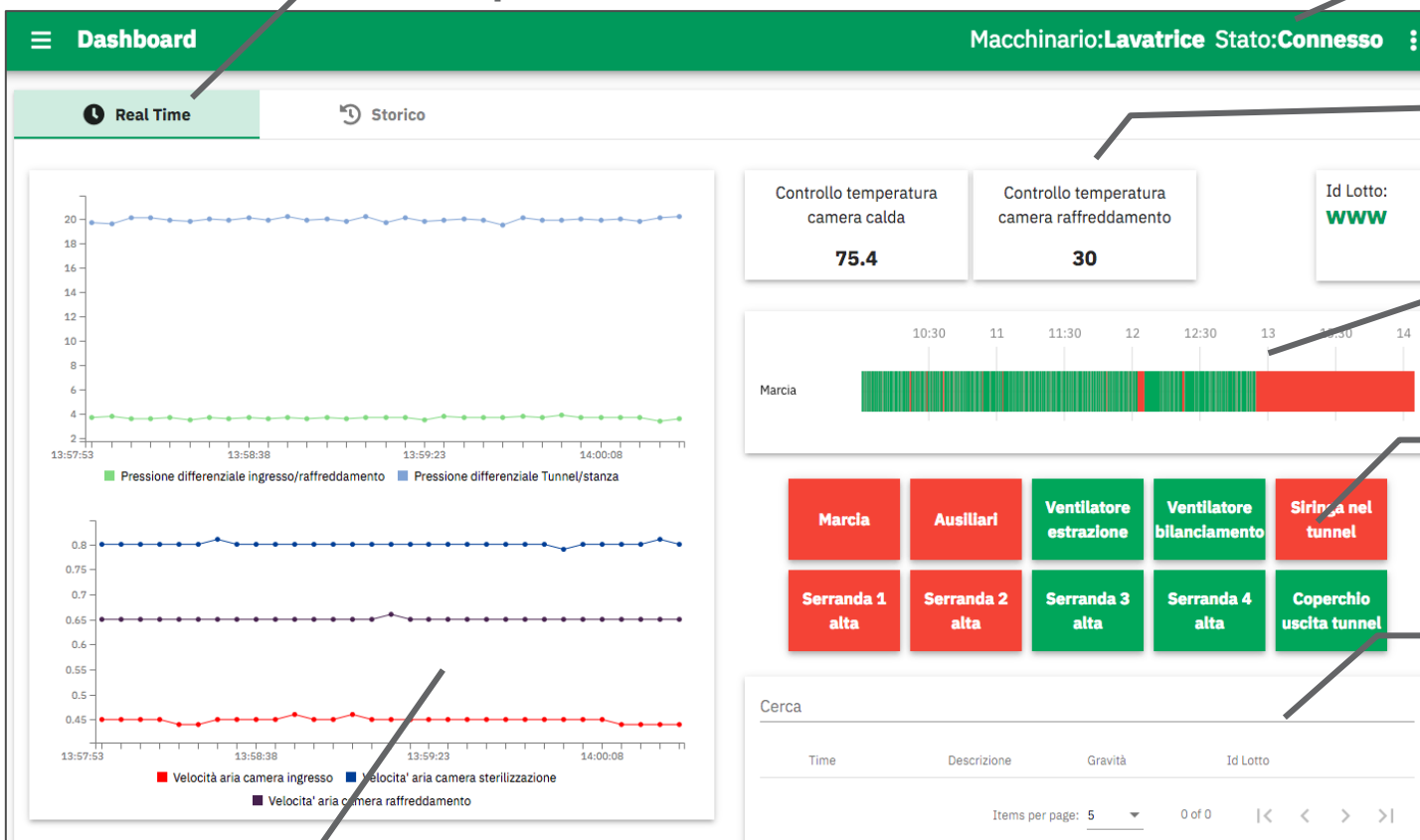
Real-time  
parameter values

Lot ID

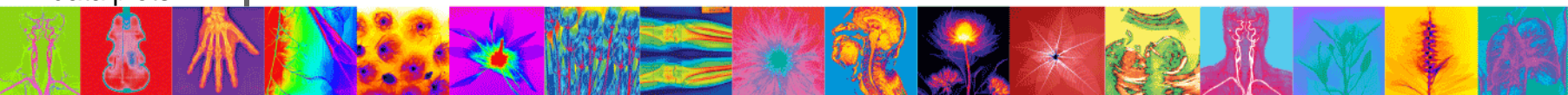
Rolling bar showing  
machine behaviour in  
the past 4 hours, in  
terms of **GO** / **STOP**

Semaphors  
associated to  
binary production  
data

Alarms table (filled  
with occurred alarm  
IDs, descriptions,  
severity level, time)



Continuous  
data plots



# Next Steps: Analytics

## Descriptive analytics

- answer “what happened,” and are getting to some of the “why did it happen” with BI, visualization, and data science-integrated software
- Ensure we’re building our analytics on a strong foundation

## Diagnostic analytics

- detect patterns and relationships and their true drivers to get to the real story and debunk false correlations
- With guided data discovery, it’s possible to drill down into exact causes

## Predictive analytics

- a combination of advanced analytics capabilities that span statistical analysis, predictive modeling, data mining, text analytics, entity analytics, optimization and machine learning
- predictive analytics is more than a desktop tool that suggests the factors most likely to affect outcomes





# Transition from Pharma to Chemical-Pharmaceutical

The same approach can be applied to our Chemical – Pharmaceutical plant.

Our Plants are already managed and controlled by a MES (Manufacturing Execution System); key parameters, alarms and trends are already displayed and available for the operators.

In this environment it will be easier to use a millions of data to improve the efficiency through the analytics.

**THE KEY** will be to select the right step of the process (the right data)

- **Bottleneck**
- **Critical step affecting the quality of the product**
- **Critical steps in terms of Safety or environment**
- Of course the peculiar constrains will be considered (ex: ATEX guidelines)



# Critical Success factors for the Digital Transformation

*“Digital transformation demands a new operations strategy”*

Think beyond the “possible”

Data is the real value

Look to the marketplace

*“Keep data safe”*

Build your baseline

Don’t reinvent the wheel

Create a trusted ecosystem

*“You still need people in a digital world”*

Make people part of the plan

Recognize that you get what you pay for

Embrace cultural change.



# Some insights

