OVER **180** PLANTS SERVED WORLDWIDE EVERY YEAR

OVER **900** EMPLOYEES

FOUNDED IN **1975**

GLOBAL PRESENCE WITH **4** PLANTS

Thousands MACHINES DELIVERED

FAMECCANICA GROUP

TECHNOLOGY INSIDE

FACTS AND FIGURES

Founded in 1975 by Gruppo Angelini, in **1992 became a JV** (50/50) beetwen **Angelini** and **P&G**

THE WORLD BENCHMARK IN MACHINERY FOR DISPOSABLE HYGIENIC PRODUCTS

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BUSINESS AREAS

Lady

Baby

Adult

Packaging

Liquid Filling

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Fameccanica Products

Automatic Machines for:

- **Baby Diapers**
- **Adult Inco**
- **Lady Napkins**

hygienic absorbent products.

Automatic Machines for:

- **Liquid Filling**
- **Packaging**
- **Special**

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DIGITAL KEY PASSAGES

2012

Extend automation sw; Explore new **Digital Solutions** and potential Business Implications;

2014

Starting the **Digital Journey** developing a **Software Platform** in collaboration with **Microsoft;**

2016

IoT platform on Cloud **ready to be connected;**

Critically **re-evaluating** the platform;

Building a **Business Model** Strategy;
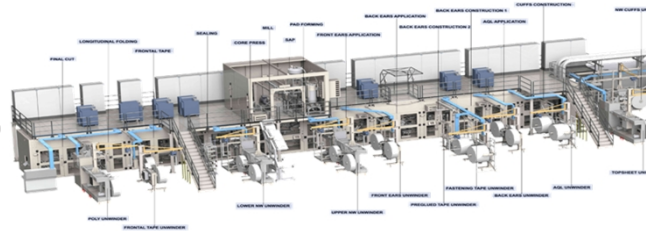
2018

IoT confirmed as **Strategic Area of Business;**

Created a new **Digital Manager Role;**

Focus on selected **Use Cases;**

Collaborating with **External Partners** to develop solutions;

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Product (the machines)

Future → **To Become an Industrial Digital Company**

Process (to produce machines)

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Real-time data
Ppm,
UpTime,
DownTime,
Rejects,
Sensors
Values, ...

Settings adjust
Temperature,
Pressure,
Vacuum,
Web Tension,
...

Data
CONTESTUALIZATION
Products, OEE

Experience
ANALYTICS
Predict what will fail in 10 hours

Action
OPTIMIZE
WorkFlow more effective

TECHNOLOGIES + **PROCESS** + **PEOPLE**

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To activate new business opportunities with (I)IoT

END USER | OEM

Lower Total Cost of Ownership

Productivity & efficiency
(remote monitoring)

Data-driven product innovation
(new product enhancements)

Total Cost to Design, Develop & Deliver

Improved Asset Utilization

Integration & Standardization

Adaptive operation
(predictive maintenance)

Sales growth
(after-sales product services)

Performance/OEE

Enterprise Risk Management

After Market Service & Support

Flexibility & safety
(MOQ & adherence to regulations)

Customer focus
(improved customers satisfaction and fidelity)

Faster Time to Market

Flexibility

SMART MANUFACTURING

INTELLIGENT MACHINES & EQUIPMENT

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2013 – to date: Digital Documentation

Virtual Reality App
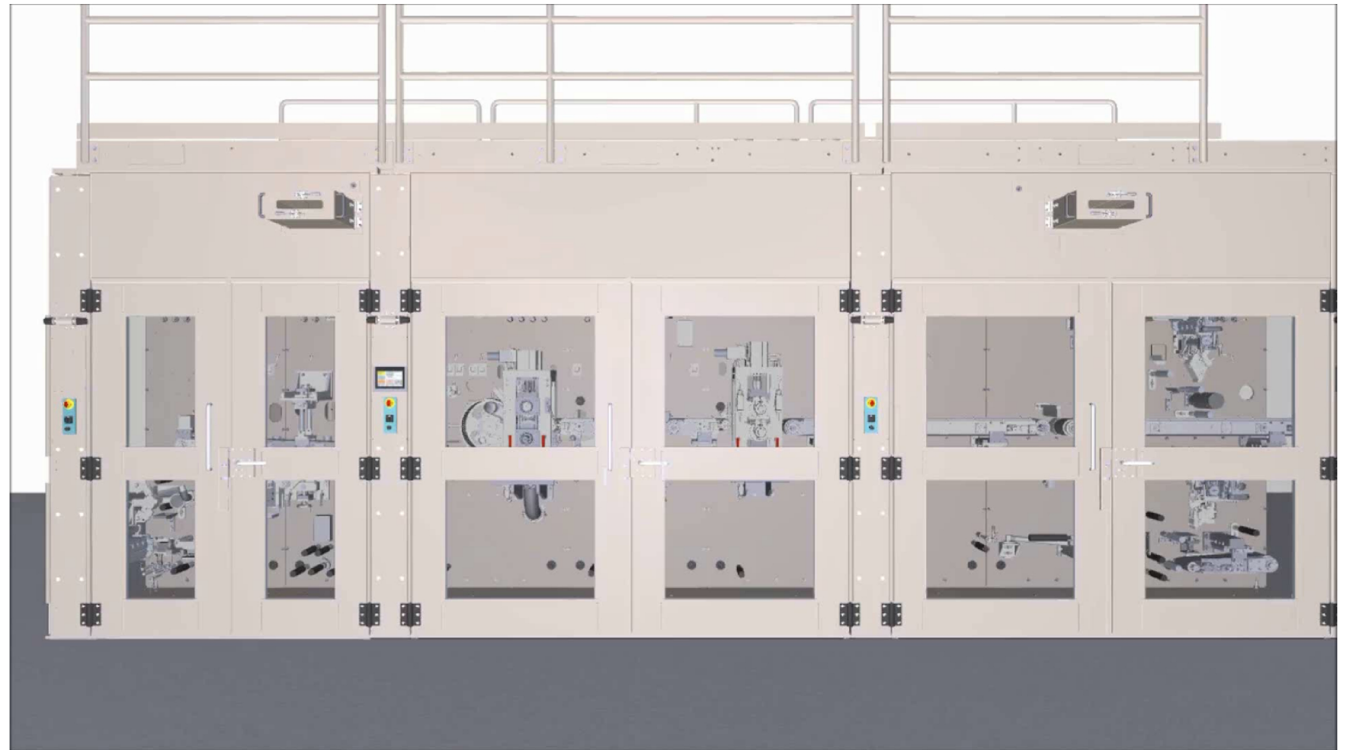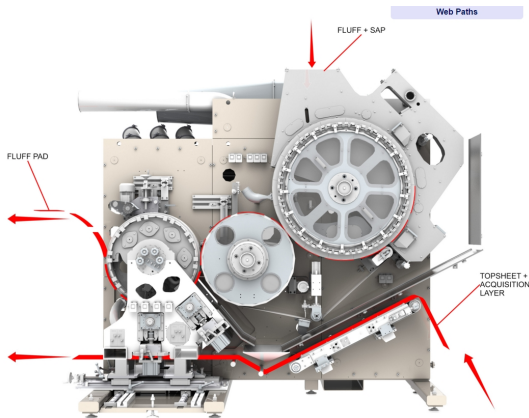
2013 – to date: Digital Documentation

Augmented Reality App
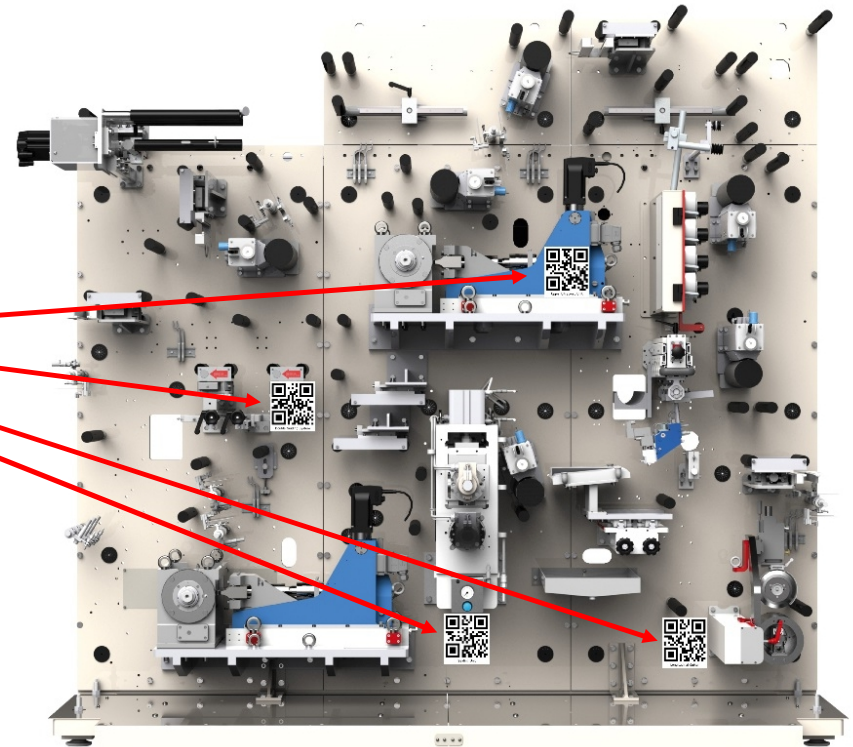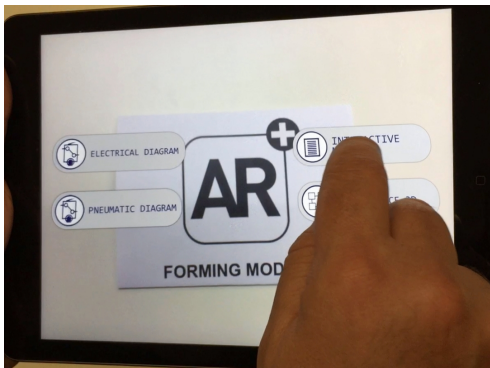
Selecting with a tablet one of the specific QR Code related to the Units, the user can access to the dedicated procedures (installation, maintenance, ..)

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# 2014 – 2016: Digital Platform (1° development)

FAMECCANICA IN PARTNERSHIP WITH
MICROSOFT DEVELOPED **EASYLIFE**™, FOR
AN EASY MANAGEMENT OF THE MACHINES
AND PLANT COMPLEXITY

2015 - 2017: Condition Monitoring

Field Agent

GE Intelligent Platforms Equipment Insight system

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UNIVERSITÀ DEGLI STUDI DE L'AQUILA

LIAMLAB
RESEARCH · DEVELOPMENT · TECHNOLOGY

Fameccanica and **UNIVAQ** worked in the "*PERFORMANCE project*" to build a reliable model to solve maintenance problems on a condition-based approach.
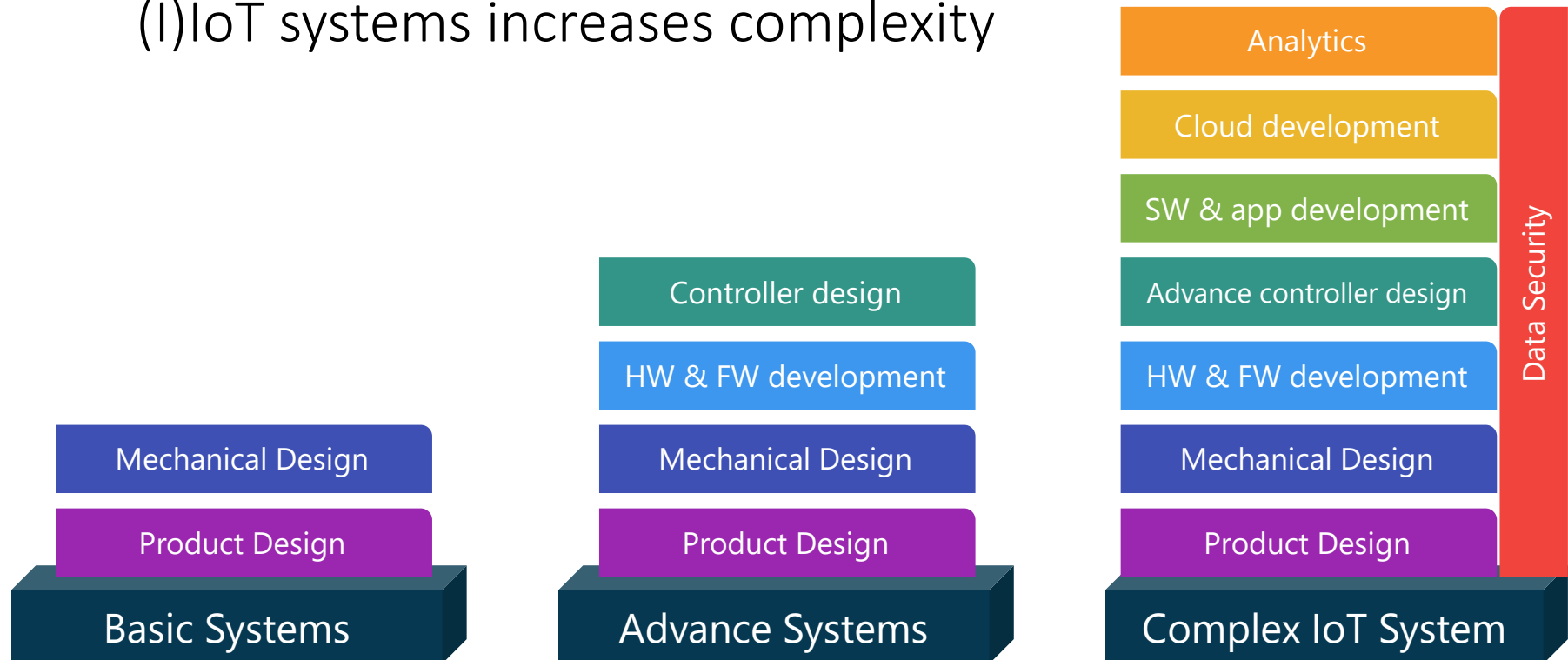**The model was tested on a Cutting Unit of a Diaper Machine.**
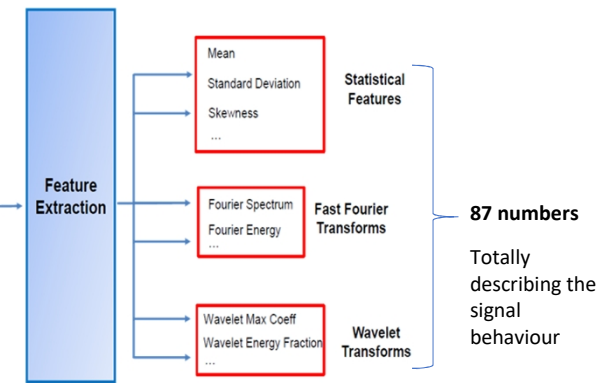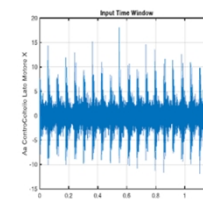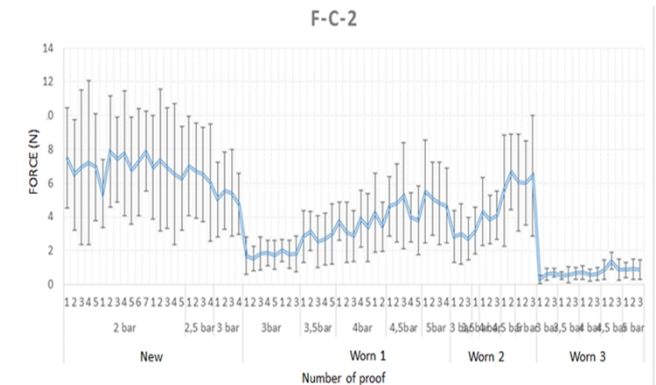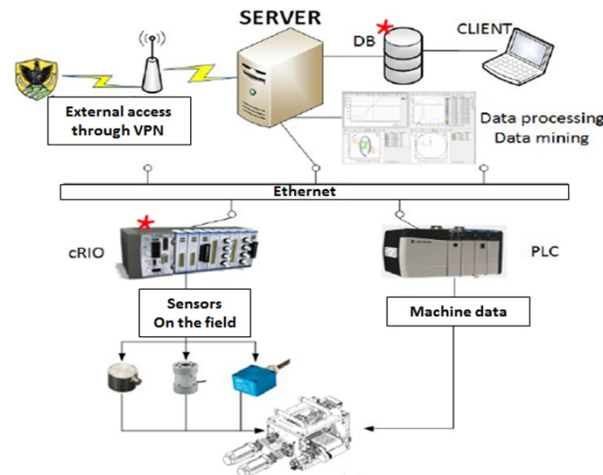
The acquired data was transferred in real time to the UNIVAQ laboratory through a GE Field Agent.
After development of the model, data were analyzed to derive the possible correlations; this activity was carried out in collaboration with LIAMLAB.

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What we learned from all these experiences

(I)IoT systems increases complexity

Basic Systems	Advance Systems	Complex IoT System
		Analytics
		Cloud development
		SW & app development
	Controller design	Advance controller design
	HW & FW development	HW & FW development
Mechanical Design	Mechanical Design	Mechanical Design
Product Design	Product Design	Product Design

Data Security

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What we learned from all these experiences

(I)IoT initiatives need attention to avoid failure

Define
- ❌ Loose business opportunities
- ❌ Unclear and incomplete use cases
- ❌ Complex Systems to communicate
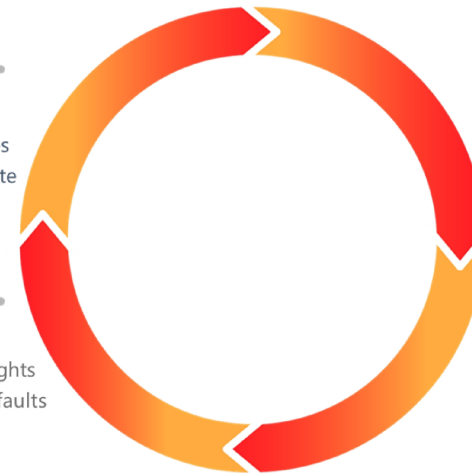
Learn and Improve
- ❌ Missing critical data
- ❌ Unable to extract actionable insights
- ❌ Unable to identify root cause of faults

Validate
- ❌ Ensuring market-fit and early buy-in
- ❌ High cost of mistakes
- ❌ Prototypes not technically or financially feasible

Deliver
- ❌ Skills or capacity gap to build IoT
- ❌ Aligning and syncing teams
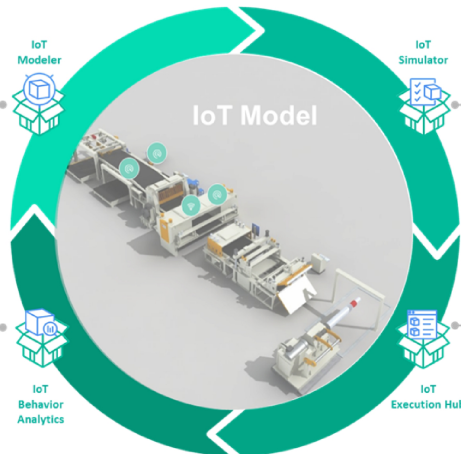- ❌ Detailed, complete specs and keeping them up to date

Define
- ✓ Visual, structured modeling
- ✓ Agile concept development
- ✓ Capture more business opportunities

Learn and Improve
- ✓ Auto-generated analytics
- ✓ Root cause of product issues
- ✓ Product usage insights to improve adoption & profit

IoT Model

IoT Modeler

IoT Simulator

IoT Behavior Analytics

IoT Execution Hub

Validate
- ✓ Virtual prototyping
- ✓ Simulated analytics
- ✓ Mistake-proofing

Deliver
- ✓ Auto-generated specs
- ✓ Financial & technical feasibility
- ✓ IoT partner marketplace
- ✓ Integrate existing tools

(I)IoT key success factors (delivery platform)
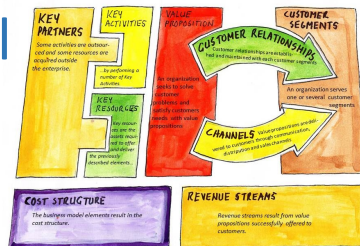
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2017: What went well and what did not 👍👎

We conducted an in-depth analysis of choices and solutions with the support of a consultant with the aim to better figure out and set:
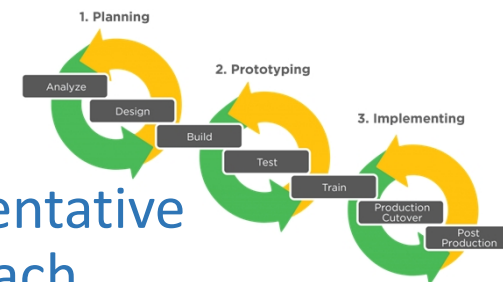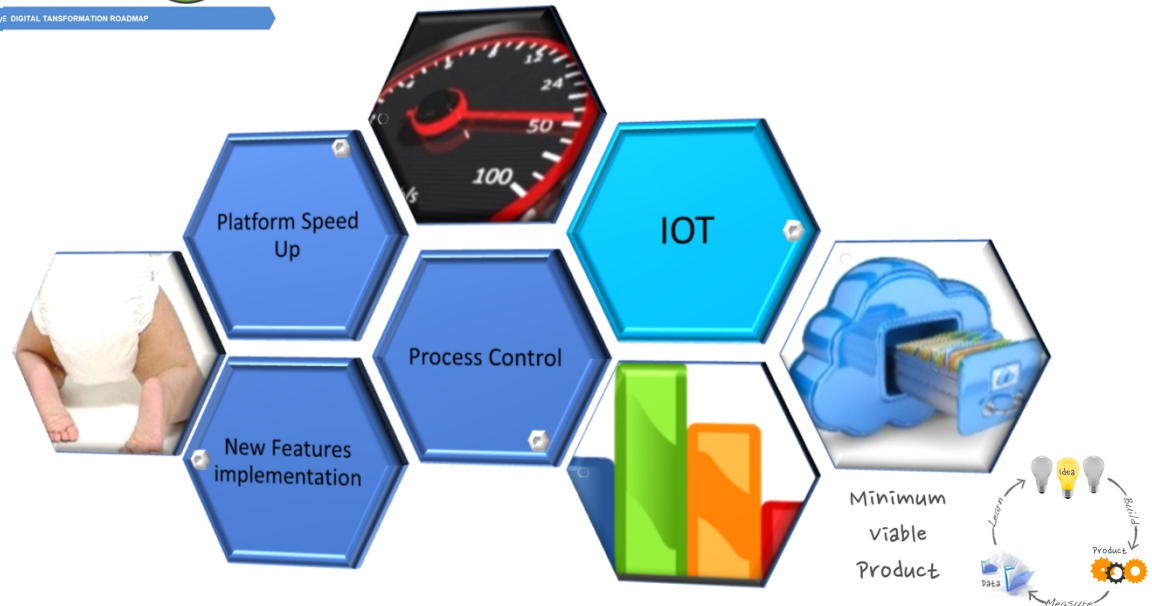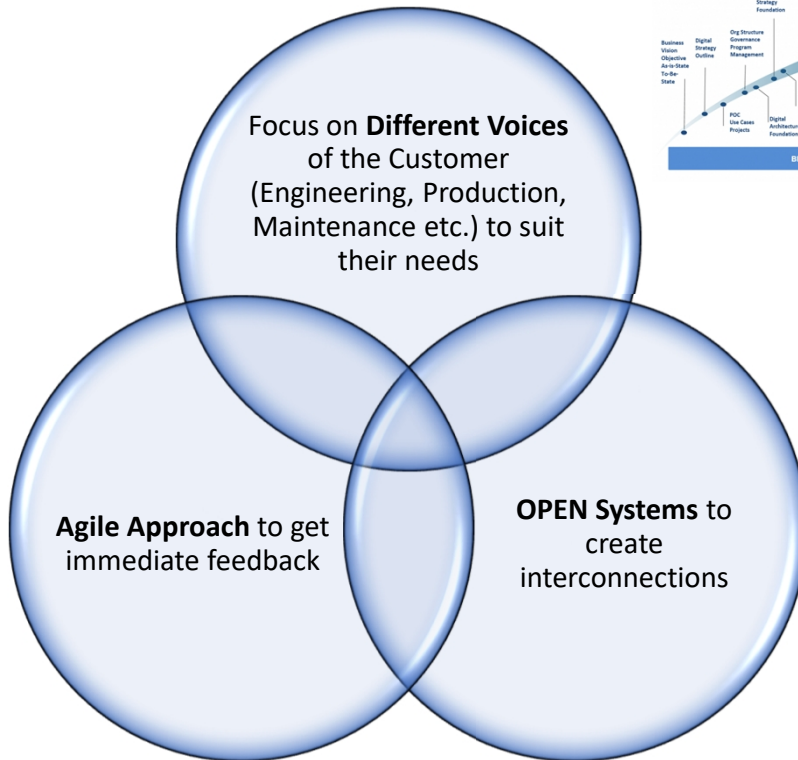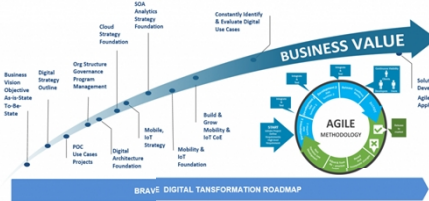
1. Strategic Vision

2. Business Model

3. Implementative Approach

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Digital Strategy - Key Pillars

Focus on **Different Voices** of the Customer (Engineering, Production, Maintenance etc.) to suit their needs

Agile Approach to get immediate feedback

OPEN Systems to create interconnections

Focusing on **develop Digital Product** to create **Added Value to Customer** and **New Business Opportunities**

Platform Speed Up

IOT

Process Control

New Features implementation

Minimum viable Product

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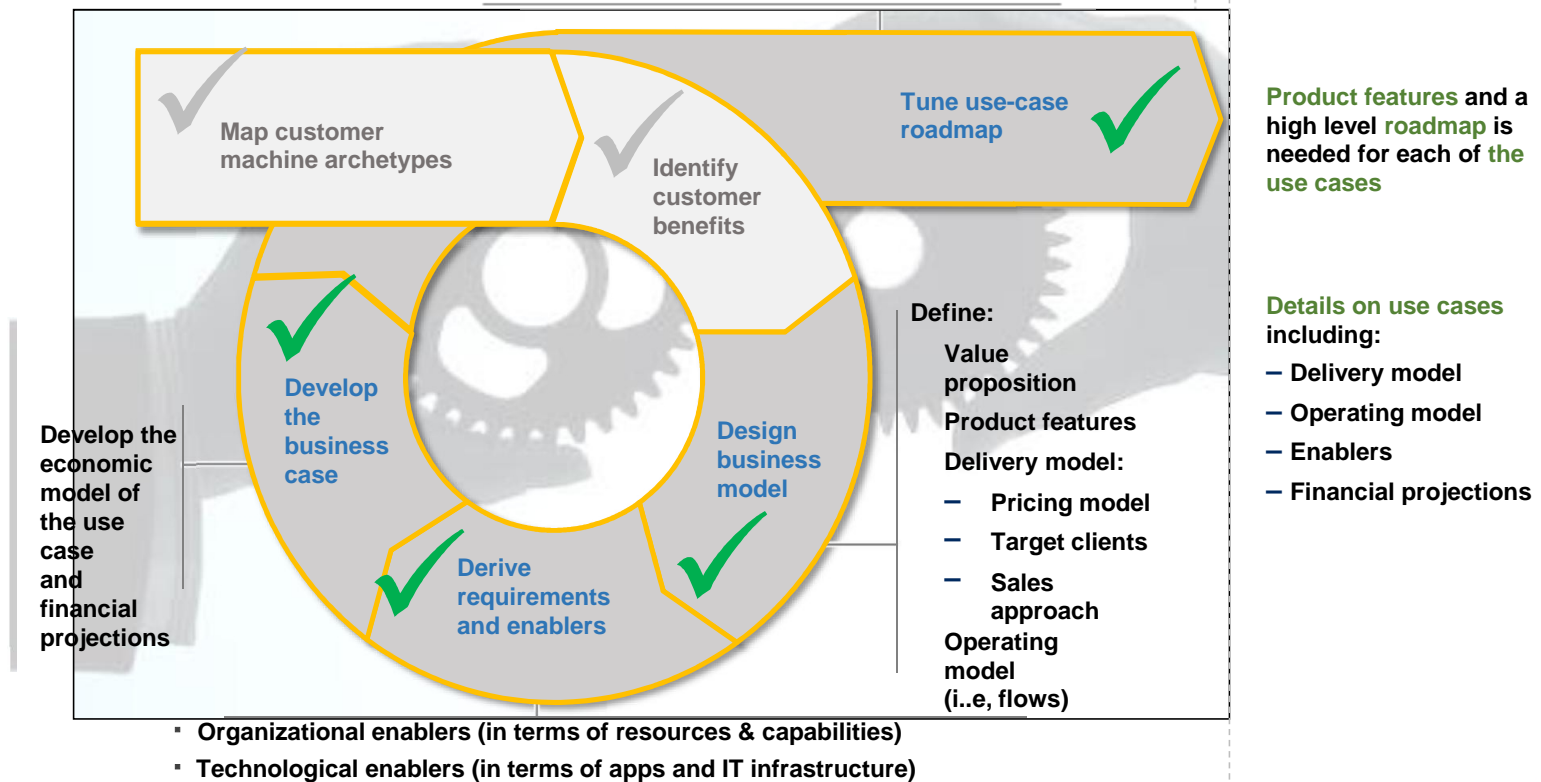Non stop innovation

Business Model Definition

✓ ~~Building the Vision~~

✓ ~~Analyze the current status~~

✓ **Select the most critical issues**
   - ▪ **Define use cases**
   - ▪ **Use cases deep diving**

✓ **Evaluate organizational implications**

✓ **Assessing the financial impact**

✓ ~~Designing Next steps towards implementation~~

✓ ~~Make a plan for maintain & improve the system~~

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Implementing Approach – Use Cases

Structured Analysis Framework

- **Develop execution roadmap (orga, ops, …), incl. commercial test with pilot customers**

Map customer machine archetypes

Identify customer benefits

Tune use-case roadmap

Develop the business case

Design business model

Derive requirements and enablers

Develop the economic model of the use case and financial projections

Define:
Value proposition
Product features
Delivery model:
- Pricing model
- Target clients
- Sales approach

Operating model (i..e, flows)

Product features and a high level **roadmap** is needed for each of **the use cases**

Details on use cases including:
- Delivery model
- Operating model
- Enablers
- Financial projections

- **Organizational enablers (in terms of resources & capabilities)**
- **Technological enablers (in terms of apps and IT infrastructure)**
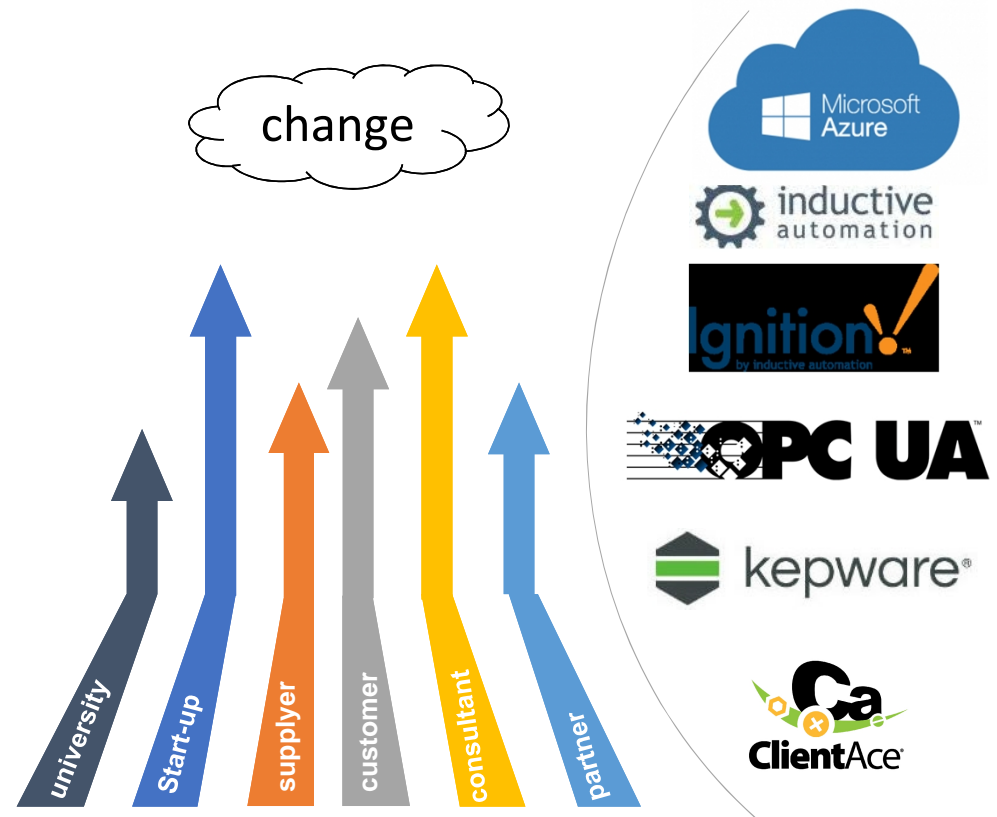
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Objectively it is evident that .....

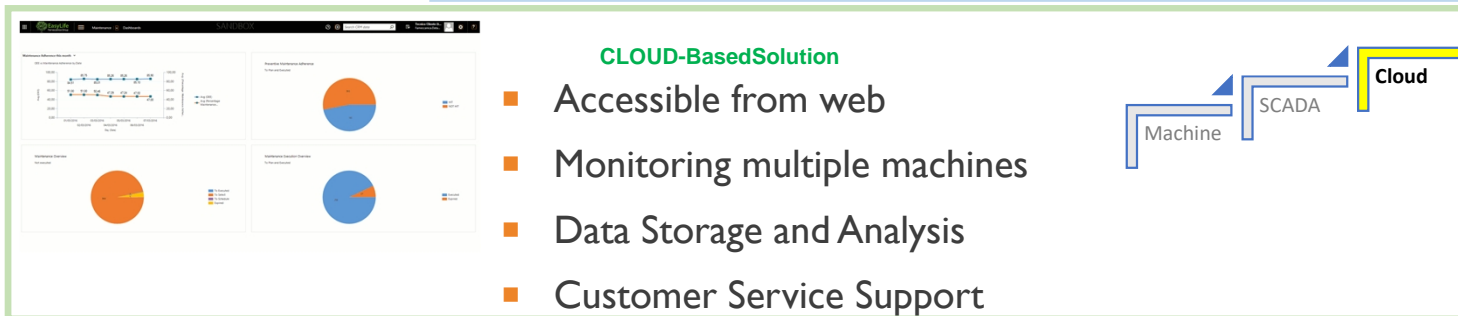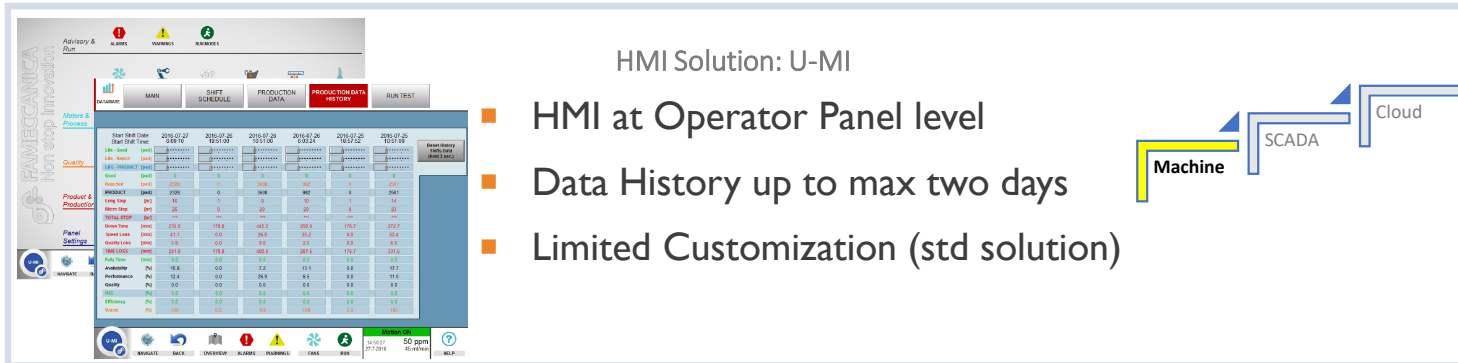### Staying alone is no longer possible!

No company has, at the same time, all the skills to manage the complexity of the evolution in progress.

It's necessary to focus on collaborations, agreements and alliances with partners to create new ecosystems for enabling optimal management of change.
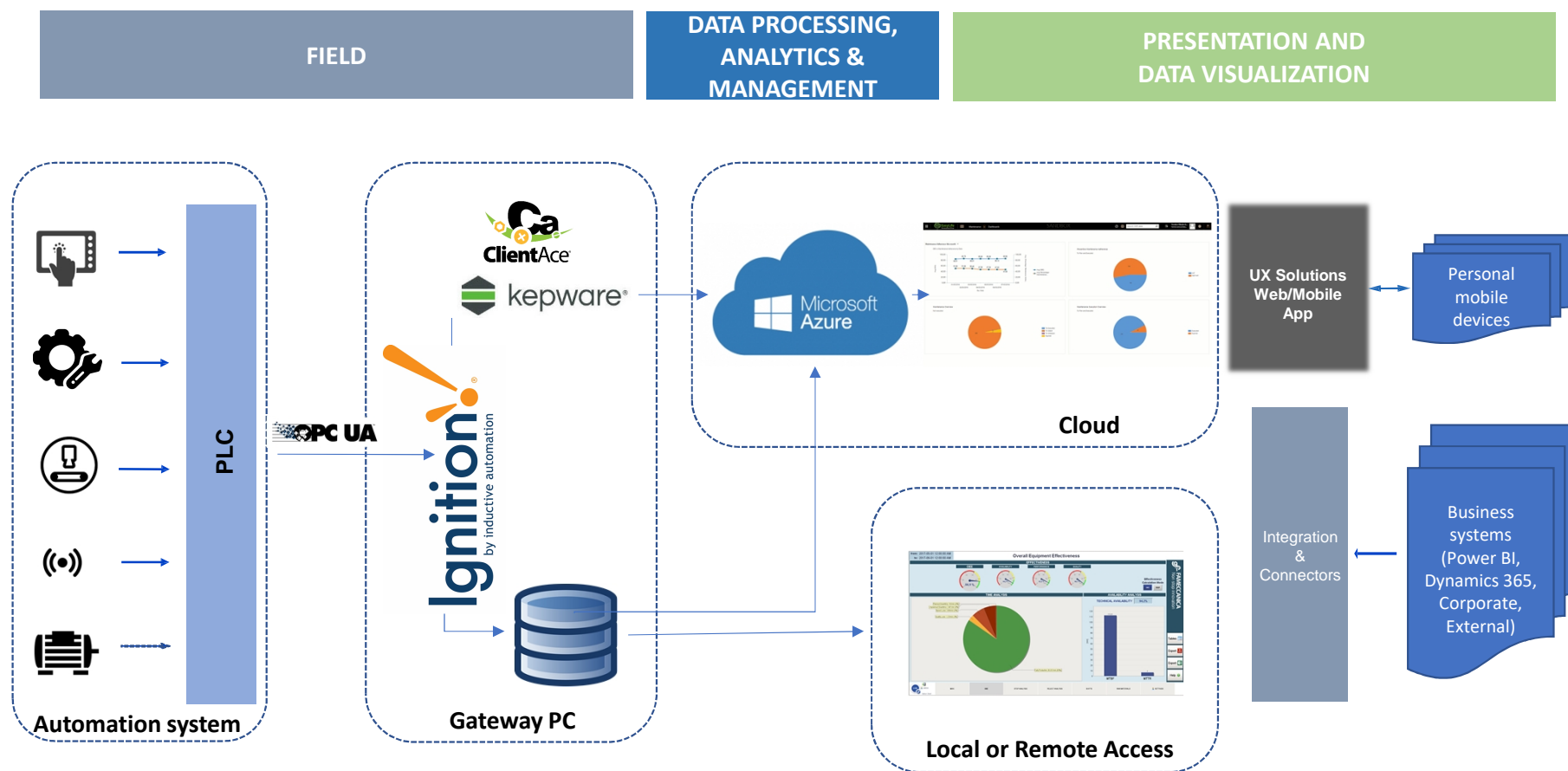
change

university   Start-up   supplyer   customer   consultant   partner

Microsoft Azure

inductive automation

Ignition!
by inductive automation

OPC UA

kepware

ClientAce

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Fameccanica: Examples of Implemented Solution

HMI Solution: U-MI

- HMI at Operator Panel level
- Data History up to max two days
- Limited Customization (std solution)

SCADA Solution:DATAMANAGER

- Accessible from Company Network
- Monitoring single machine
- Data Storage and Analysis
- MES and ERP Interface

CLOUD-BasedSolution

- Accessible from web
- Monitoring multiple machines
- Data Storage and Analysis
- Customer Service Support

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Simplified System Architecture – HMI/SCADA/CLOUD Levels

FIELD	DATA PROCESSING, ANALYTICS & MANAGEMENT	PRESENTATION AND DATA VISUALIZATION

Automation system

PLC

OPC UA

ClientAce

kepware

Ignition by inductive automation

Gateway PC

Microsoft Azure

Cloud

Local or Remote Access

UX Solutions Web/Mobile App

Personal mobile devices

Integration & Connectors

Business systems (Power BI, Dynamics 365, Corporate, External)

Overall Equipment Effectiveness

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Selected High Priority Use Cases

- **WAVE 1** Use Cases (2018-19)

  A. Changeover Optimization
  B. Raw Material Consumption
  C. Testing Time Reduction

- **WAVE 2** Use Cases (2019-21)

  D. Full Quality: Raw material and final product full control


○ Complexty

Investment (€)

D

C

A

B

Time for
implementation

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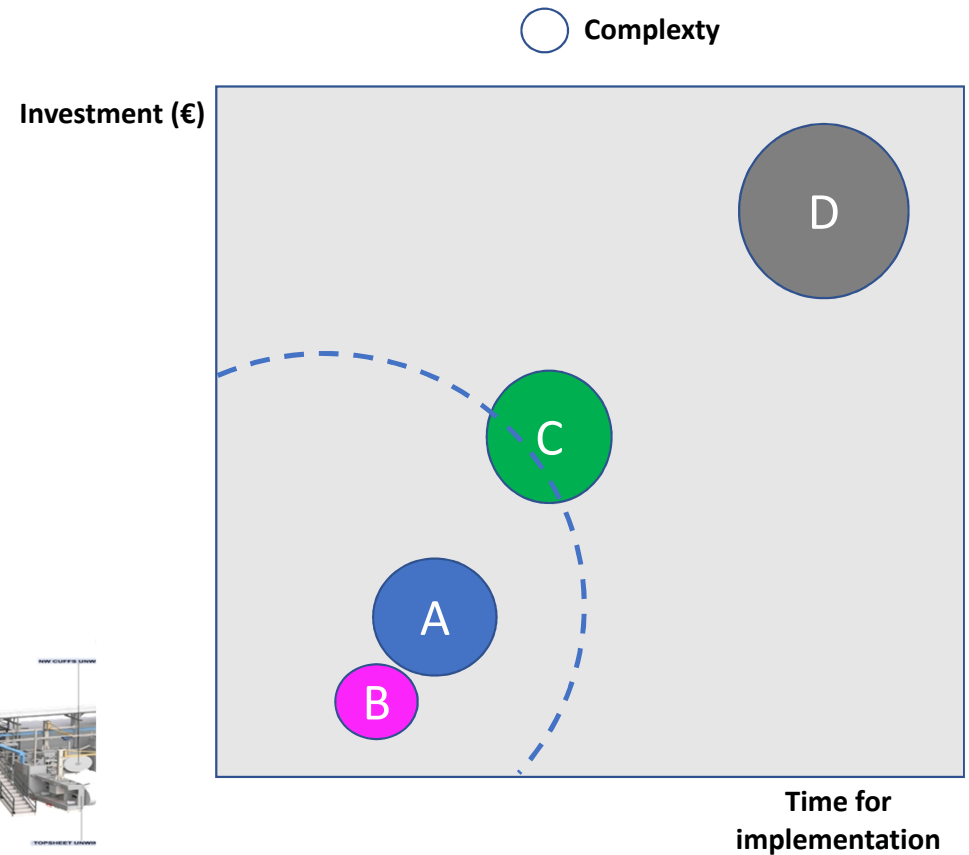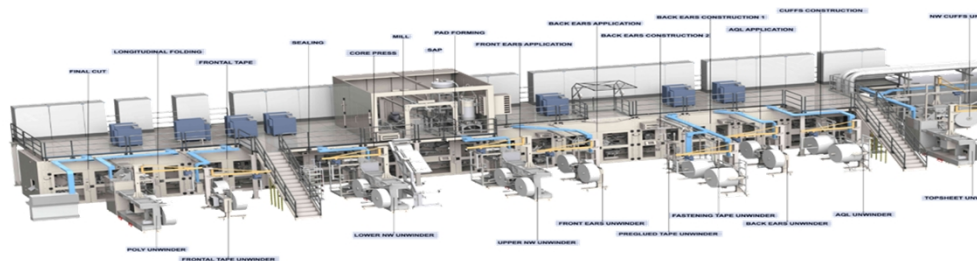
Changeover Optimization

GOAL

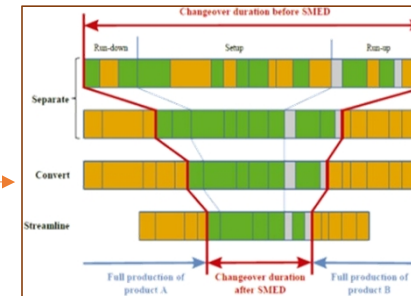Introduce digital technology to **reduce the time needed to change** the machine from producing one size to another

BENEFITS

Reduce the **changeover time by 50%** vs current; **Estimated incoming revenue** for reducing downtime for the customer is **xx € per year.**
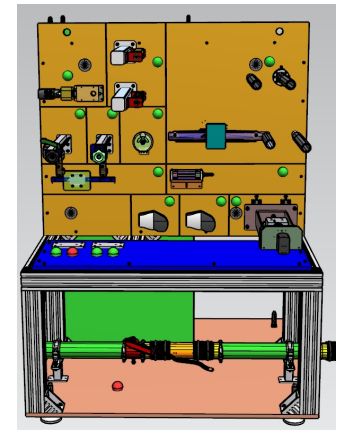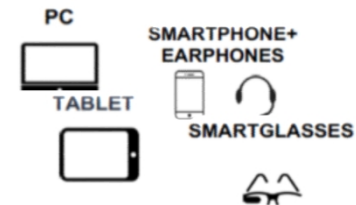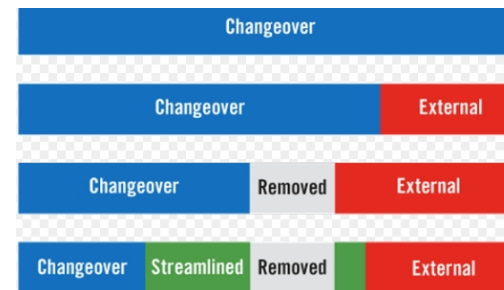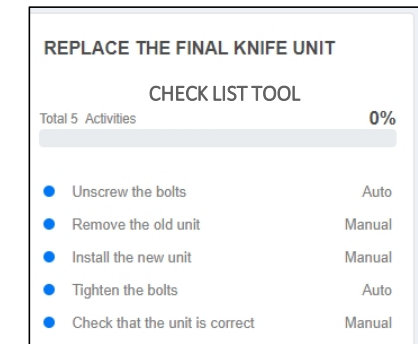
Use Case n.1: Changeover Digital Optimization

Planning

Part change
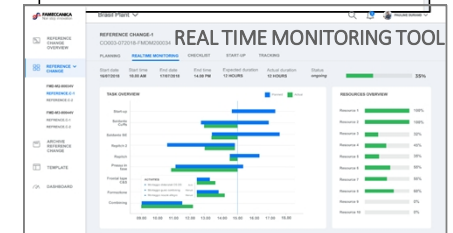
Settings

Startup

Analysis & Optimization
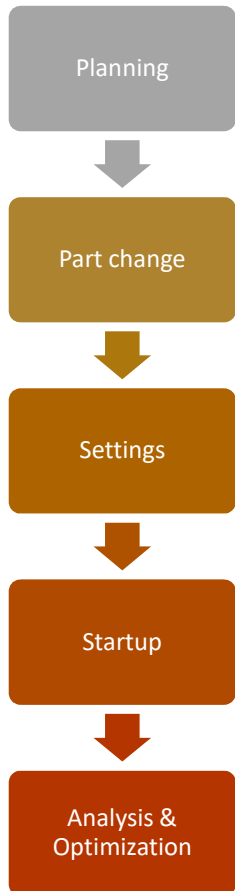
1. **New design** to optimize the part change - SMED (Single Minute Exchange of Die) methodology);

2. **New technologies** supporting digital CO activities;

REPLACE THE FINAL KNIFE UNIT

CHECK LIST TOOL

Total 5 Activities   0%

● Unscrew the bolts   Auto
● Remove the old unit   Manual
● Install the new unit   Manual
● Tighten the bolts   Auto
● Check that the unit is correct   Manual

3. **SW tool** for overall CO monitoring and management – Concept of a talking machine.

REAL TIME MONITORING TOOL

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Raw Material Consumption

GOAL

Real time monitoring of the **actual utilization** of raw materials by batch and supplier by comparing **real consumption** vs **declared quantity**

BENEFITS
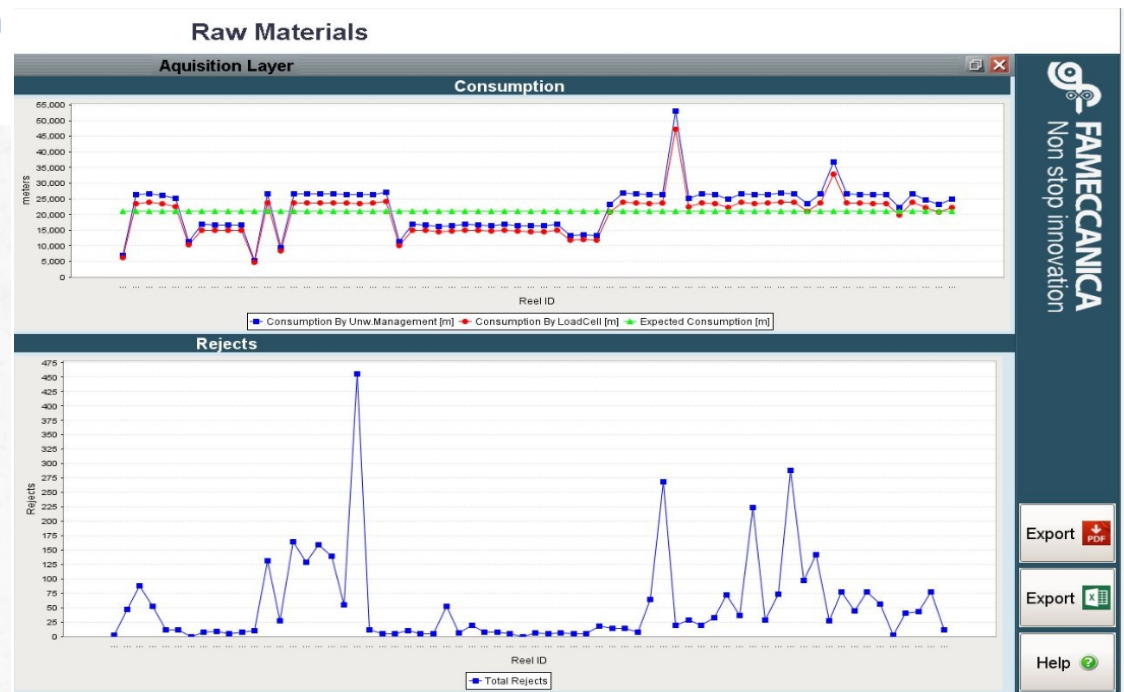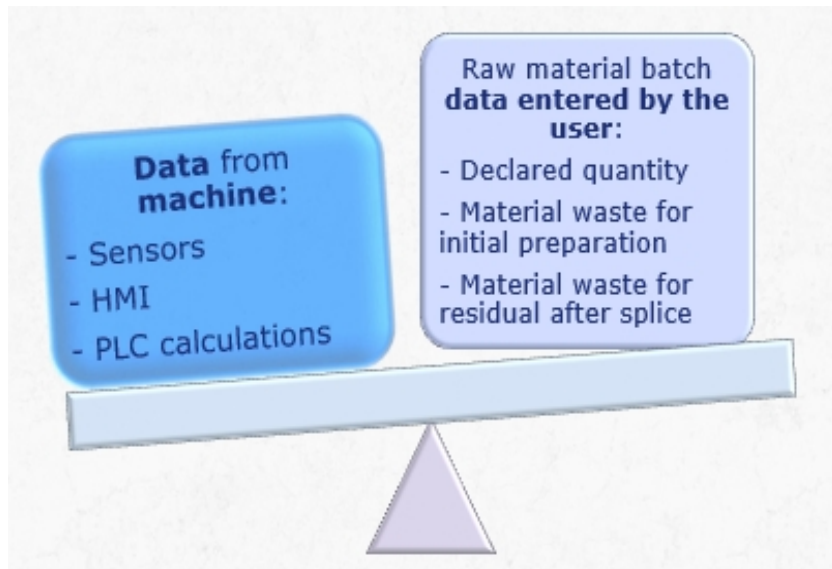
Control of raw material in terms of **Quantity** and **Quality**
Estimated saving for the customer : **xx % raw material utilization.**
Estimated value for the customer : **yy € per year per machine**.

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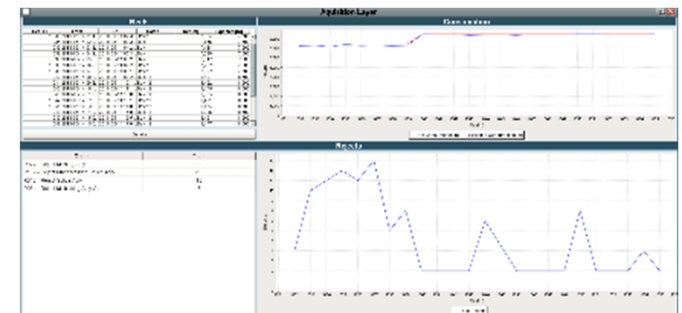
Use Case n.2: Raw Material Quality Monitoring

**Real time Monitoring of Raw Materials Utilization**

Use Case n.3: Testing Time Reduction

GOAL
Introduce digital solution to speed up the testing phase of a machine taking advantage of all the available data trhough development of a system able to suggest the first tentative settings to testing team
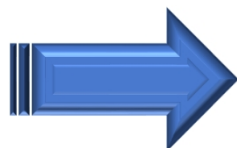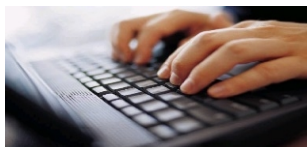
BENEFITS
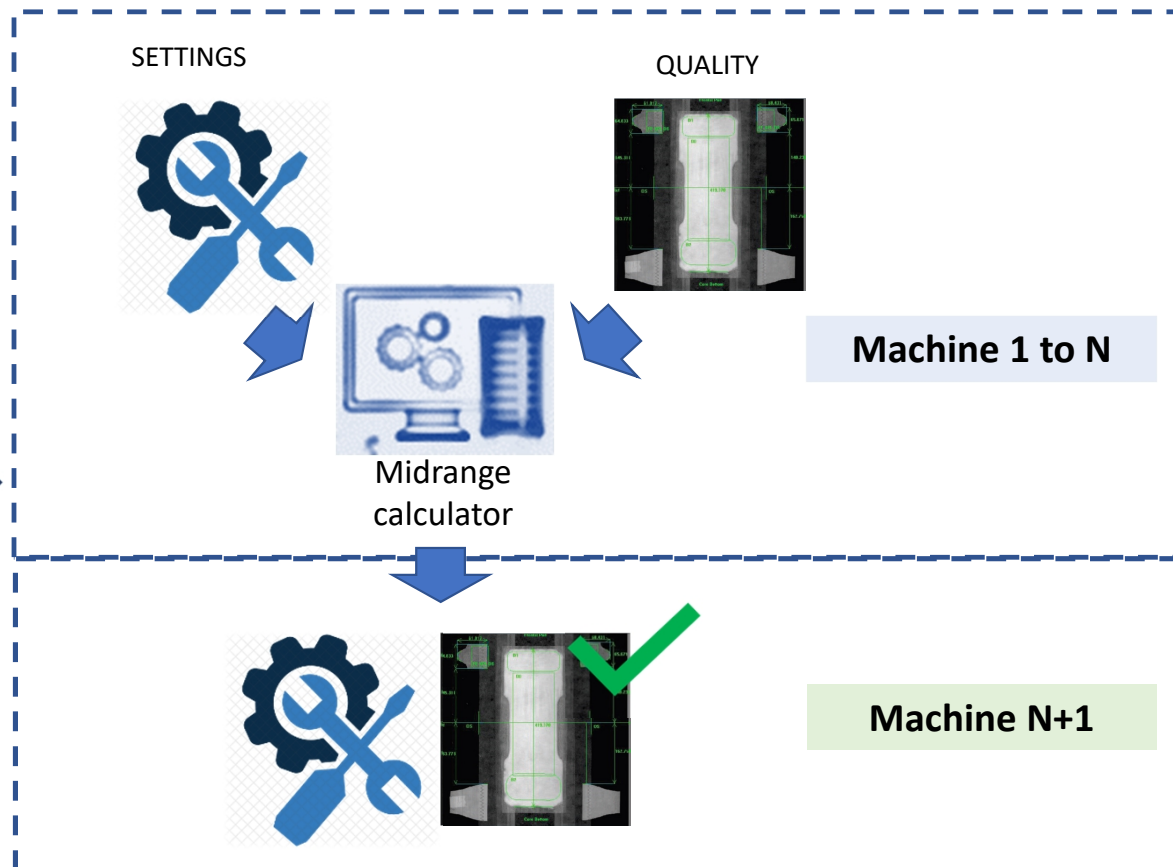**Reduce** the **testing time by 30%** compared to actual situation
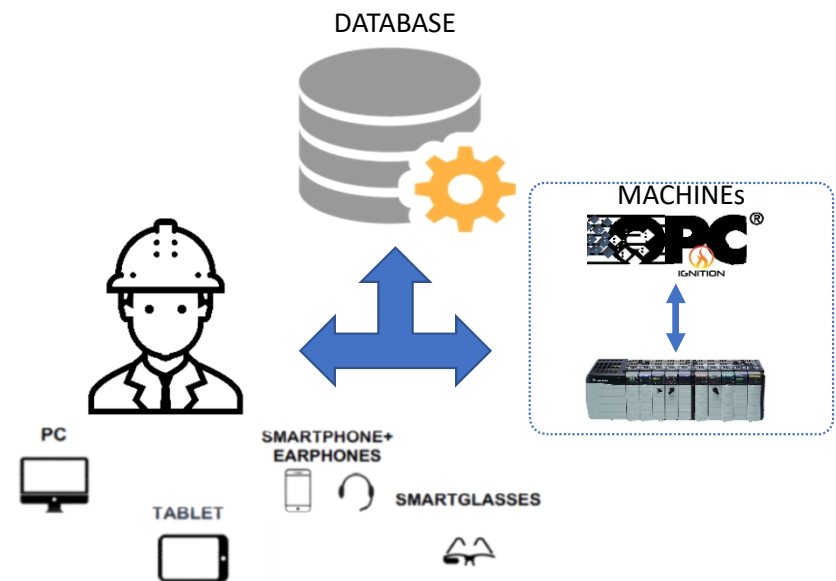
Use Case n.3: Testing Time Reduction

TESTING PROCESS ASSESSMENT

Highlights

Settings to be manually loaded and recorded by Operators at each testing phase

40% of Testing time **linked to settings** for each machine

SETTINGS

QUALITY

Midrange calculator

Machine 1 to N

Machine N+1

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Some On going Results

Long Term Agreement
New and strategical long term agreement with some Customer who focus digital solutions;

Services
An initial increase in services revenues;

Tender
Possibility to participate in international tender with digital specifications;

PEOPLE
Enrollment of a digital manager and creation of some digital champion / trainer in engineering area;
Developed some integration between engineering and IT;

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