AISIN
We Touch the Future

Mons Plant Presentation
Technifutur
2021/09/30

Agenda

General Company / Plants Presentation

Mons Site Activities

Factory of the future

Agenda

General Company / Plants Presentation

Mons Site Activities

Factory of the future

AW PHILOSOPHY

World's first

2004 FWD 2-motor
Hybrid system

World's first

2002 6-speed
Automatic Transmission

1977 4-speed
Automatic Transmission

World's first

2007 4 WD
Hybrid system

World's first

2006 8-speed
Automatic Transmission

AISIN Seiki

1969 AISIN Warner 1988 AISIN AW

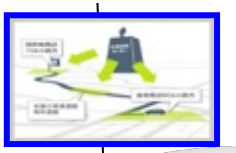
Borg Warner

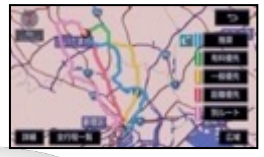
1998 DVD Navigation

2002 HDD Navigation

World's first

2007 Map on demand



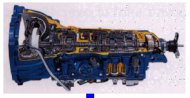


World's first

1992 Voice Navigation

World's first

1998 Navi-Matic

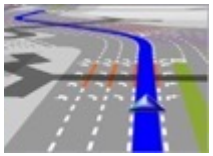


World's first

2005 Dual-View
Navigation

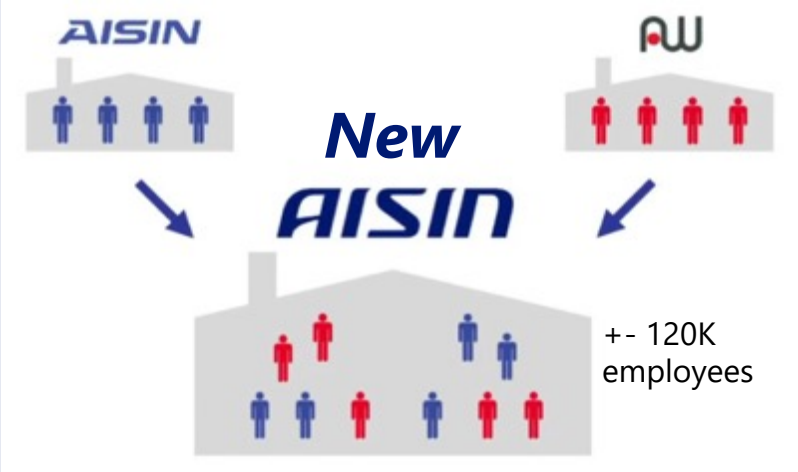
World's first

2007 High Accuracy
Location Navigation



The merge

Our Japanese group



= **New group**

= **CASE :** connected, autonomous, shared services electric

= **2021 April 1st**

In Europe

November 1st

Merge to survive in a one time event in Automotive century

Business in AW Europe

Powertrain:

- Assembly and Sales of AT
- Assembly and Sales of ATCU
- Writing softwares (flashing softwares)
- Remanufacturing of AT, Quality, marketing analysis and sales

VIT:

- Assembling and sales of VIT
- Remanufacturing of VIT, Quality,
  marketing analysis and sales

Our customers in Europe

16 car manufacturers

Powertrain

7 car manufacturers

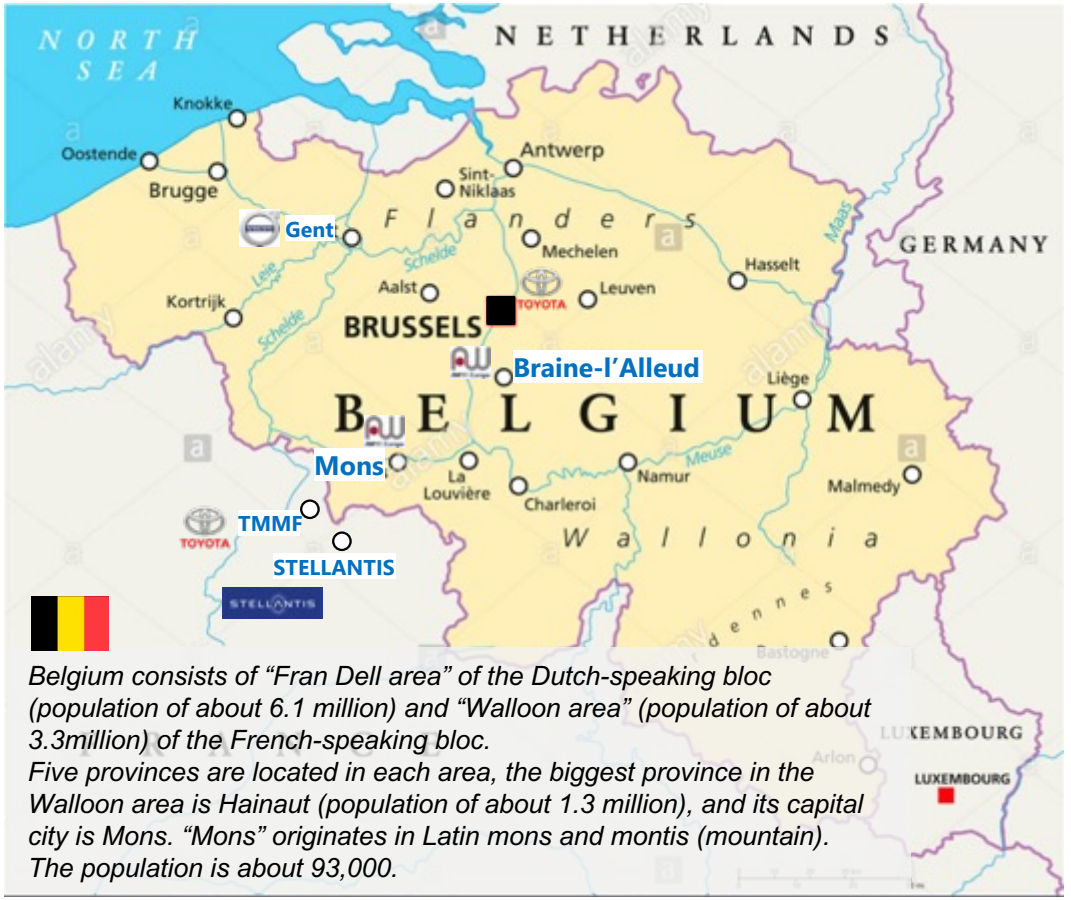
VIT

AISIN - AW (TC) Europe outline -Belgium-

Braine-l'Alleud **17,298m²**

Mons **375,145m²**

Canal in Hainaut



Belgium consists of "Fran Dell area" of the Dutch-speaking bloc (population of about 6.1 million) and "Walloon area" (population of about 3.3million) of the French-speaking bloc.
Five provinces are located in each area, the biggest province in the Walloon area is Hainaut (population of about 1.3 million), and its capital city is Mons. "Mons" originates in Latin mons and montis (mountain).
The population is about 93,000.

Brussels – Braine-l'Alleud	**25 km**
Mons – Braine-l'Alleud	**50 km**
TMMF - Mons	**30 km**
VCC Gent – Mons	**100 km**
STELLANTIS – Mons	**40 km**

Braine-l'Alleud Site

AW-EUR

Powertrain
- Quality Assurance
- Sales

VIT
- Quality Assurance
- Sales
- Project Management

Support
- HR
- LP&F
- Finance
- IT

AWTC-EUR

Powertrain
- Product Management
- Testing
- Software Development

VIT
- Project Control
- Testing
- Software Development

Mons Site

AW-EUR

- AT Manufacturing
  - AT Production & Remanufacturing
  - VB & sub-assy production & remanufacturing
  - Quality Investigation
  - Special Projects
  - EOL flash process
- Electronics Production
  - AT ECU
  - Navi ECU
  - Navi Systems
- Navi Remanufacturing & repair
  - Quality Investigation
  - Special Projects
- Logistics
  - OE distribution center
    - ATCU
    - VIT
  - Aftersales distribution center
    - AT & AT components
    - VIT

AWTC-EUR

- Powertrain
  - Testing

Agenda

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Mons Site Activities

Factory of the future

Agenda

General Company / Plants Presentation

Mons Site Activities

Factory of the future

Mons Site Overview

Mons Site Overview

Mons site certifications

Agenda

Mons Site Activities

Electrical Operations

Logistics Operations

Powertrain Operations

Electrical Operations

AT ECU: Serial production AT ECU

NAVI: Serial production NAVI ECU & MMX Board

Micro SD for MAP

AT ECU

NAVI

Agenda

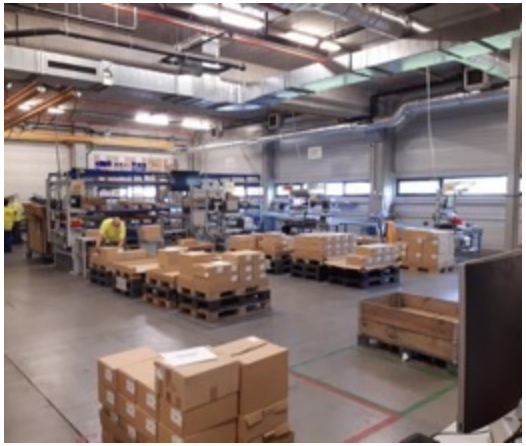
Mons Site Activities

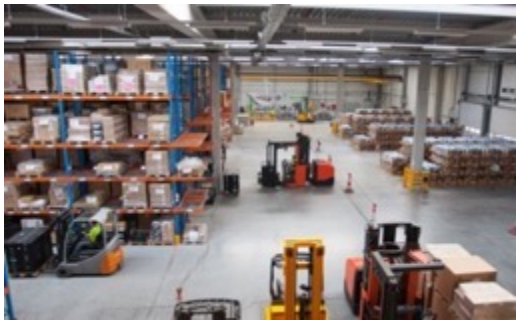
Electrical Operations

Logistics Operations

Powertrain Operations

Logistics Operations


AT After Sales:	Supply chain & distribution center for Europe
Electrical OE Logistics:	Supply chain & distribution center for Europe
A/T OE Logistics:	EOL and distribution center for Europe
	Mass Distribution for OE Plant in 24 Hours
General	Customs Specialist

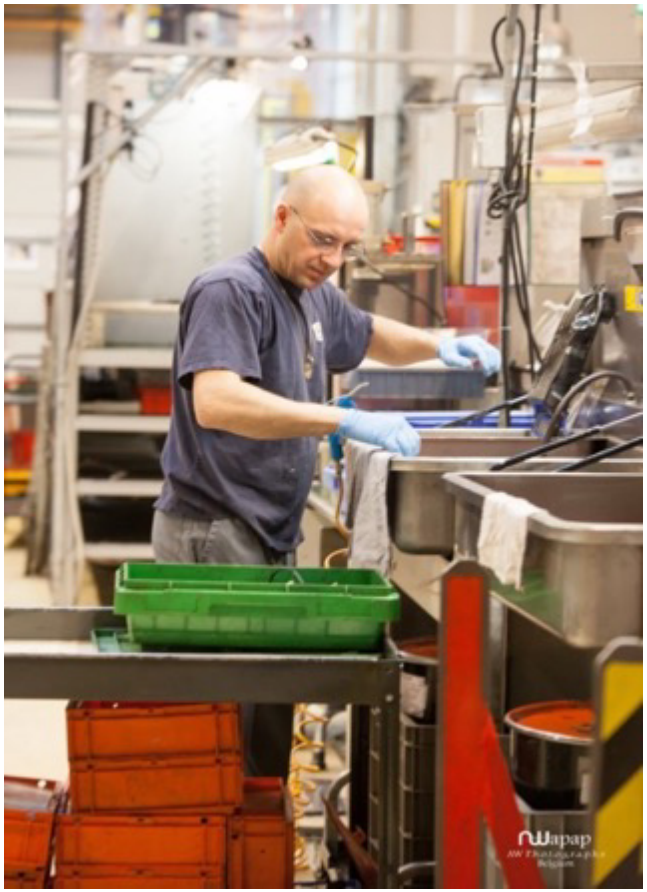
Mons Site Activities

Electrical Operations

Logistics Operations

Powertrain Operations

Powertrain Operations



AT EOL:	Flash AT ECU upon customer demand
AT Assy:	Remanufacturing, Spare Parts & OE
Valve Body Assy:	Remanufacturing, Spare Parts & OE
Sub Assy:	Oil pump, planetary, counter driven, differential

AT Assy FF

AT Assy FR

VB Assy

Oil Pump Assy

Differential

Counter Driven

Counter Drive

Planetary

Why promoting Remanufacturing Activities?

Ecological reasons - carbon footprint reduction by saving raw material and energy.

Quality reasons – a remanufactured transmission has the same performance as the original one.

Economical reasons – offering the best quality at better pricing conditions compared to a new product.

*A **Remanufactured** transmission is not a **repaired** or **rebuilt** part!*

Keywords:

- **Core** ***(original part with failure(s))***
- **Standardised industrial processes**

RETURN MATERIAL LOOP

CAR DEALER

OEM LOCAL CORE COLLECTION CENTER

OEM CENTRAL CORE MANAGEMENT

Up to 365 days

Core brokers impact

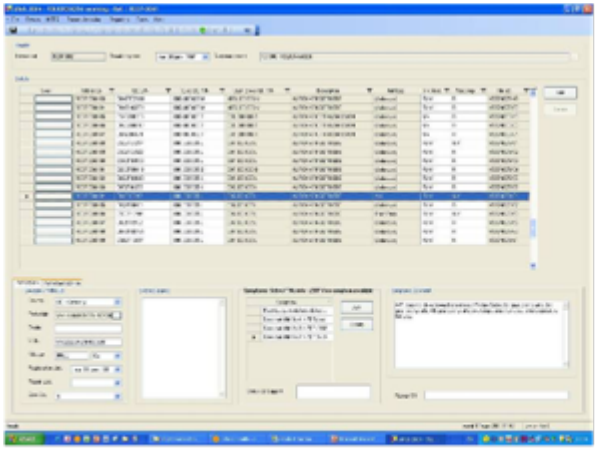
Scrap metal yards impact

Process details

1. Core receiving
2. Investigation
3. Process entry
4. Disassy & washing
5. Inspection & Assy
   a. Valvebody
6. Test & validation
7. NG mgt

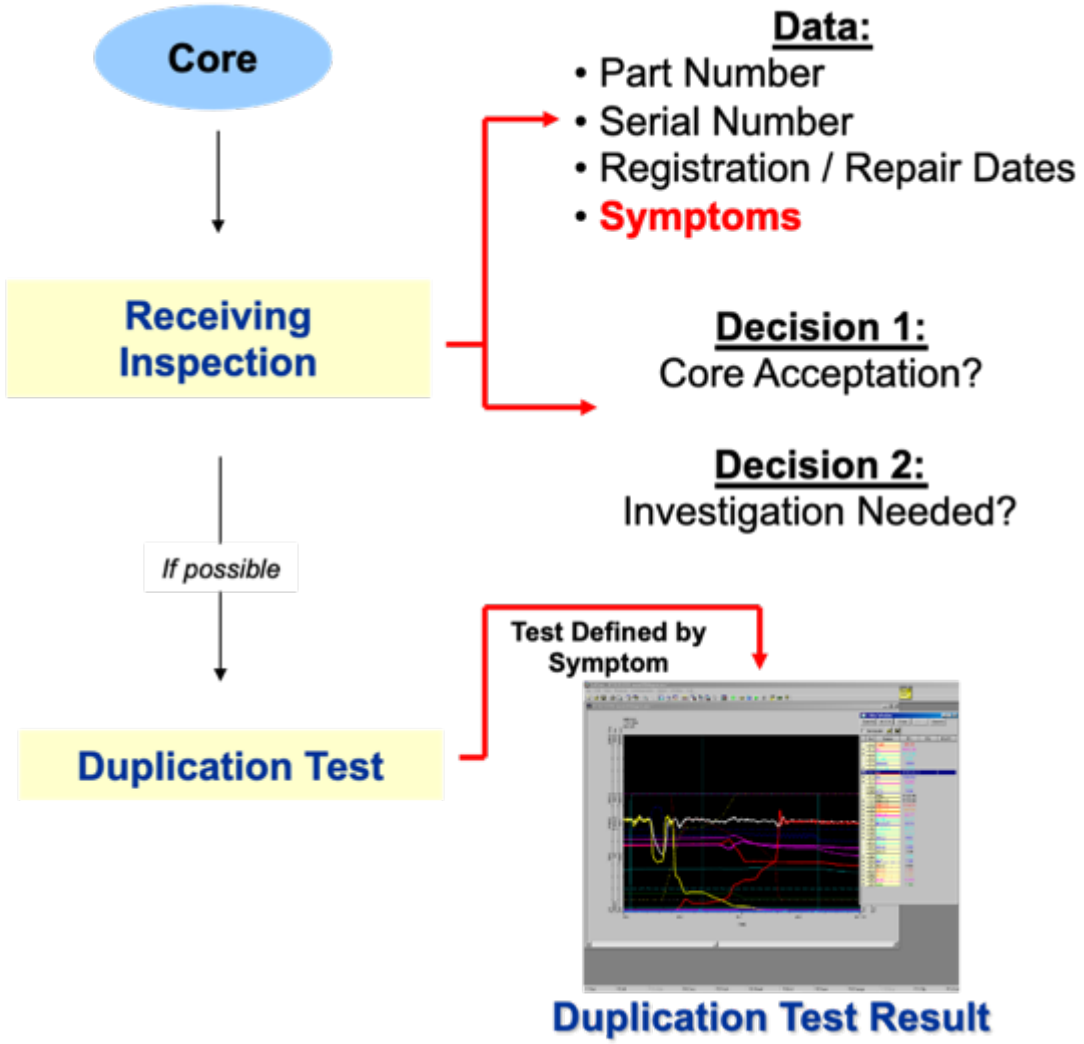
Process steps

1. Core receiving and identification



Receiving Records

Duplication Test



Duplication Test Result

Process steps

2. Investigation

Metrological Room

'High Mileage' Parts

Investigation Method Linked to Symptom

Investigation

Investigation

Core Needed for Reman

Reman Activity

Core Not Needed for Reman

Stock

Process steps

3. Process entry

Core

↓

WO (Work Order)

↓

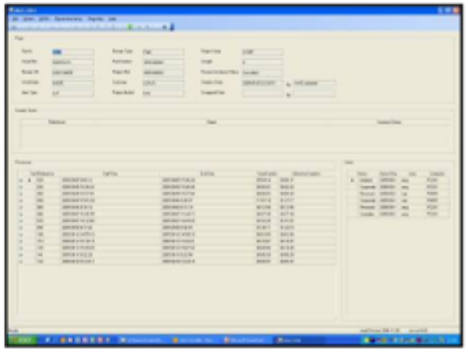
Quality record created in ARES system

↓

Stamping of Reman Identification

"Core"

Reman Stamp



Advanced Reporting System (quality & productivity records)

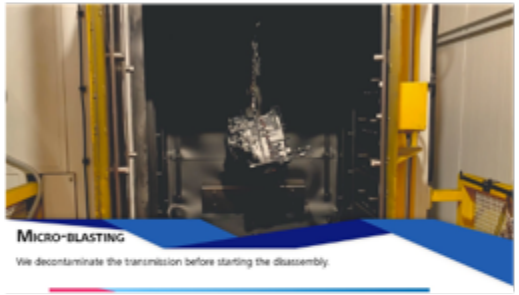
- AT Traceability
- Process Time
- Quality Measurements

Process steps

4. A/T Disassy & washing

Disassembling

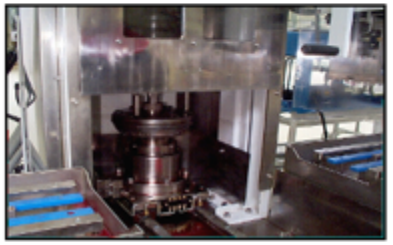
A/T sand blasting *(If Needed)*



Parts Washing

Solvent based : 99% reuse

Torque Converter Flushing

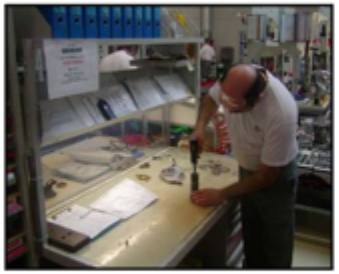


VB process

Process steps

5. Inspection & Assy process

Parts Inspection



V/B Parts → Specific V/B Flow

Metrological Inspection
→ Specific Tooling

Visual Inspection
→ Inspection Standards

Parts Supply

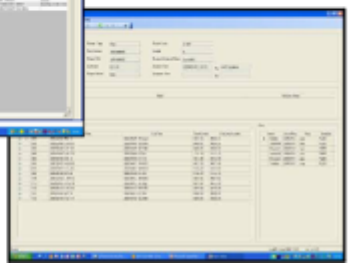
Parts Supplier = AWJ
→ Same Quality Criteria

Sub-assembling

Reman V/B

Main Assembling

Complete Traceability
(Measurements, Parts consumed, ECI)



Process steps

Inspection & Assy process : specific messages

Repeatability & Reproducibility

Poka Yoke
Tightening & marking

Calibration

4S+S
Each specific process has a dedicated tool

To be worldwide quality leader, strict discipline is required

Process steps

5a. Valve body reman

V/B Parts washing & Inspection

↓

V/B Parts picking & rewashing

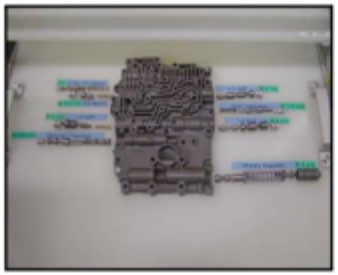
↓

V/B Sub-assembling

↓

V/B Test → Pressure Adjustment

V/B Test → Functional Test



Process steps

=> 100% A/T TESTED

Test & validation

Air Leak Test

Method: Pressure Diff.

Functional Test

3 Functional Testers (2FF & 1FR)
→ Testers Suppliers = AWJ Testers Suppliers

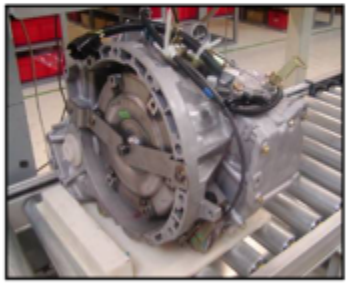
Pattern ***(linked to A/T type):***
- Similar as OE Pattern

Measures:
- Torque
- Speed
- Time
- Electrical Signals
- Pressure
- …

References:
- OE Limits
- Master A/T

Finished Goods Released,
A/T Cleaning
& Preshipment Inspection

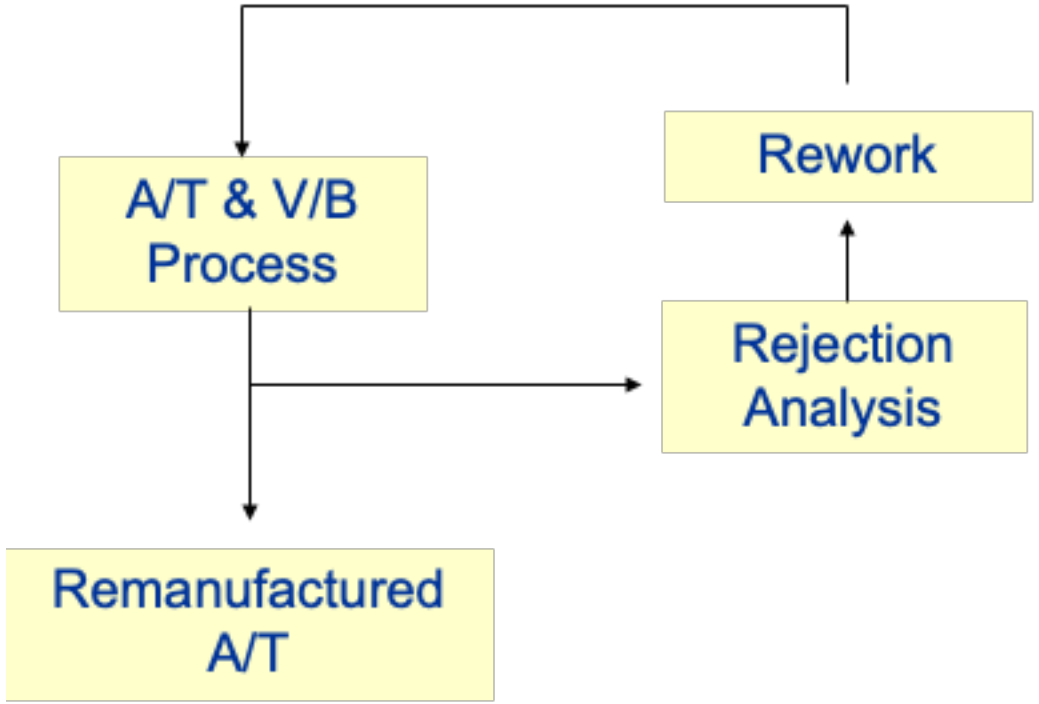
Final Product

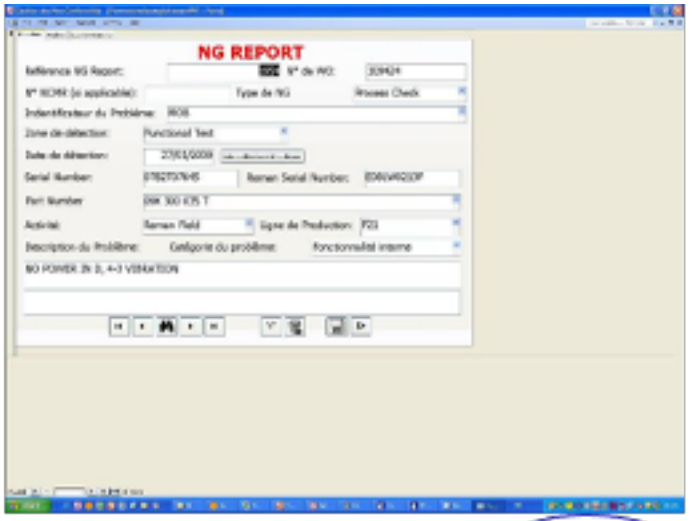


Remanufactured Transmission

Process steps

6. NG management





Competency management

Newcomer → *'Blank' Level → Not Qualified*

Training "In Room" + Training on line (coaching)

Qualification Tables

Validation 1 *(on line)* → *'Yellow' Level → Able to Work Alone*

Min 3 Months

Validation 2 *(On Production Line)* → *'Green' Level → Able to Work Alone & to give support*

Loop based on Q results

Agenda

General Company / Plants Presentation

Mons Site Activities

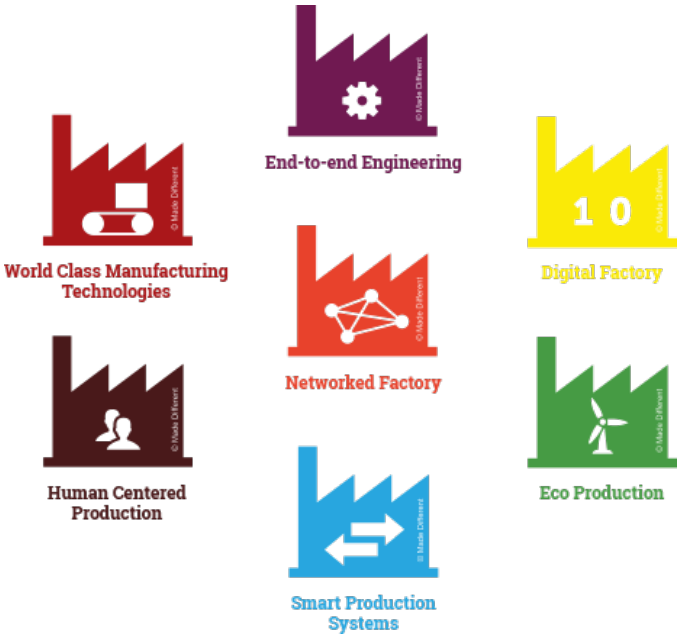
Factory of the future Award

Factory of the Future Award

FACTORY OF THE FUTURE

AW Europe

WINNER OF THE 2019 AWARD



4.0 Deployment still ongoing

PLAY

K:\Company Presentation\Mons Plant Videos\Video FoF\Factory Of the Future - AW Europe (sous-titrage anglais).mp4

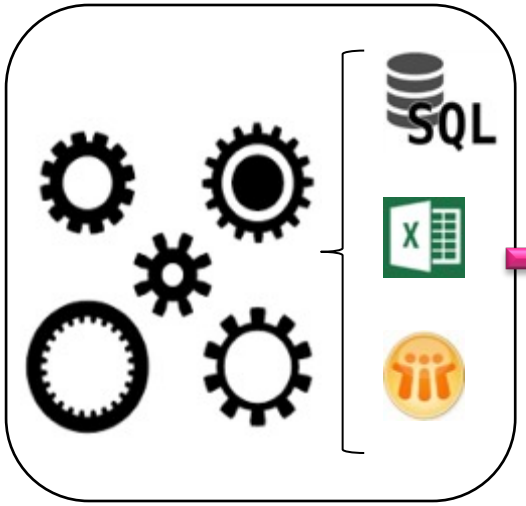
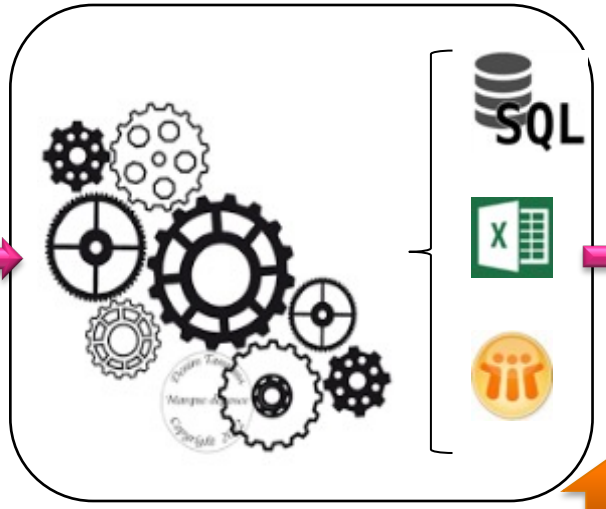
DIGITAL FACTORY

Work by exceptions based on action need

Axiom

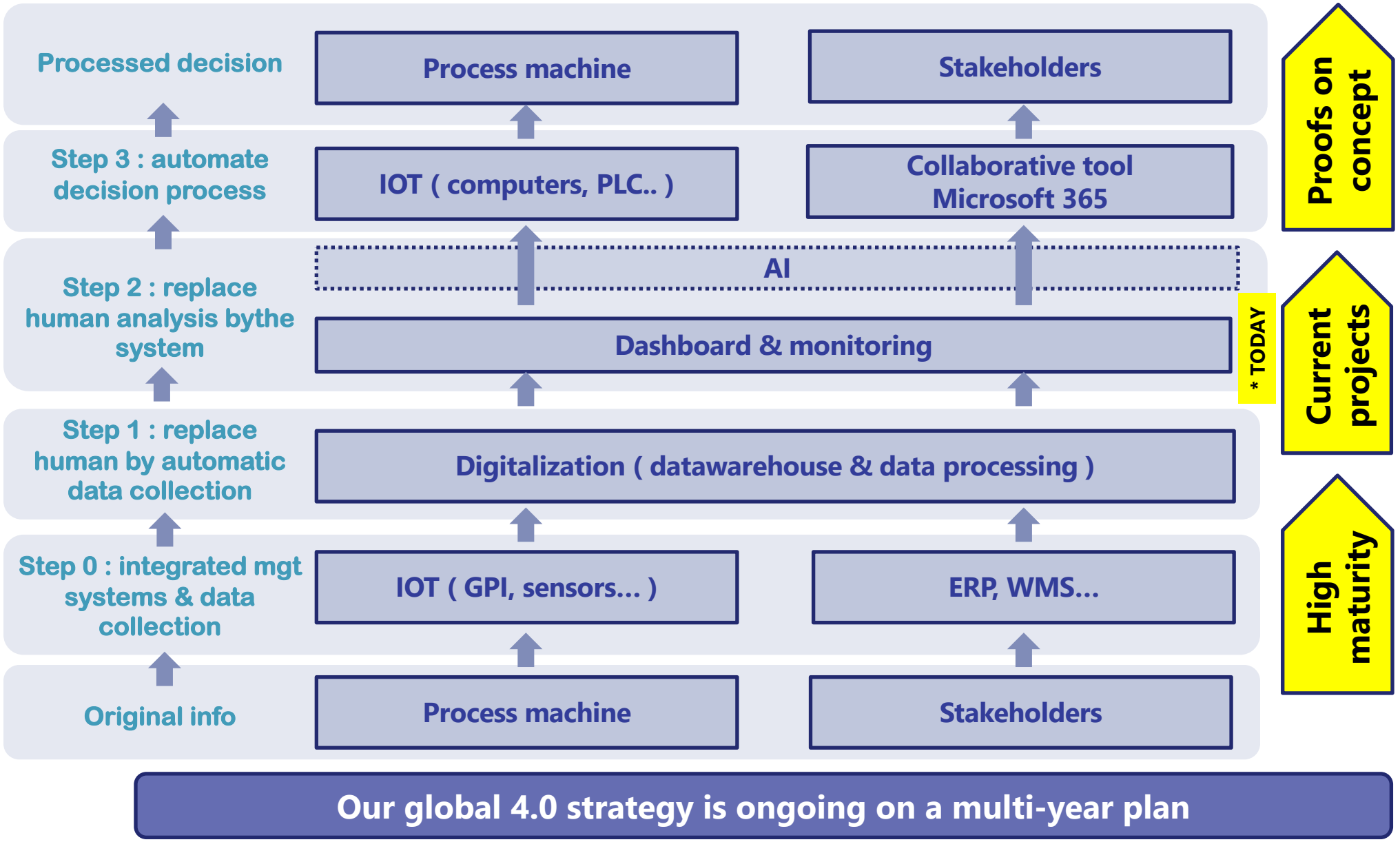
Factory = ∑ Process

i4.0 =
Interconnectivity
Compatibility
Single source of data

No interconnectivity No compatibility Multiple data source	Interconnectivity No compatibility Multiple data source	Interconnectivity Compatibility Single source of data
		

We are here

Digitalisation global process view

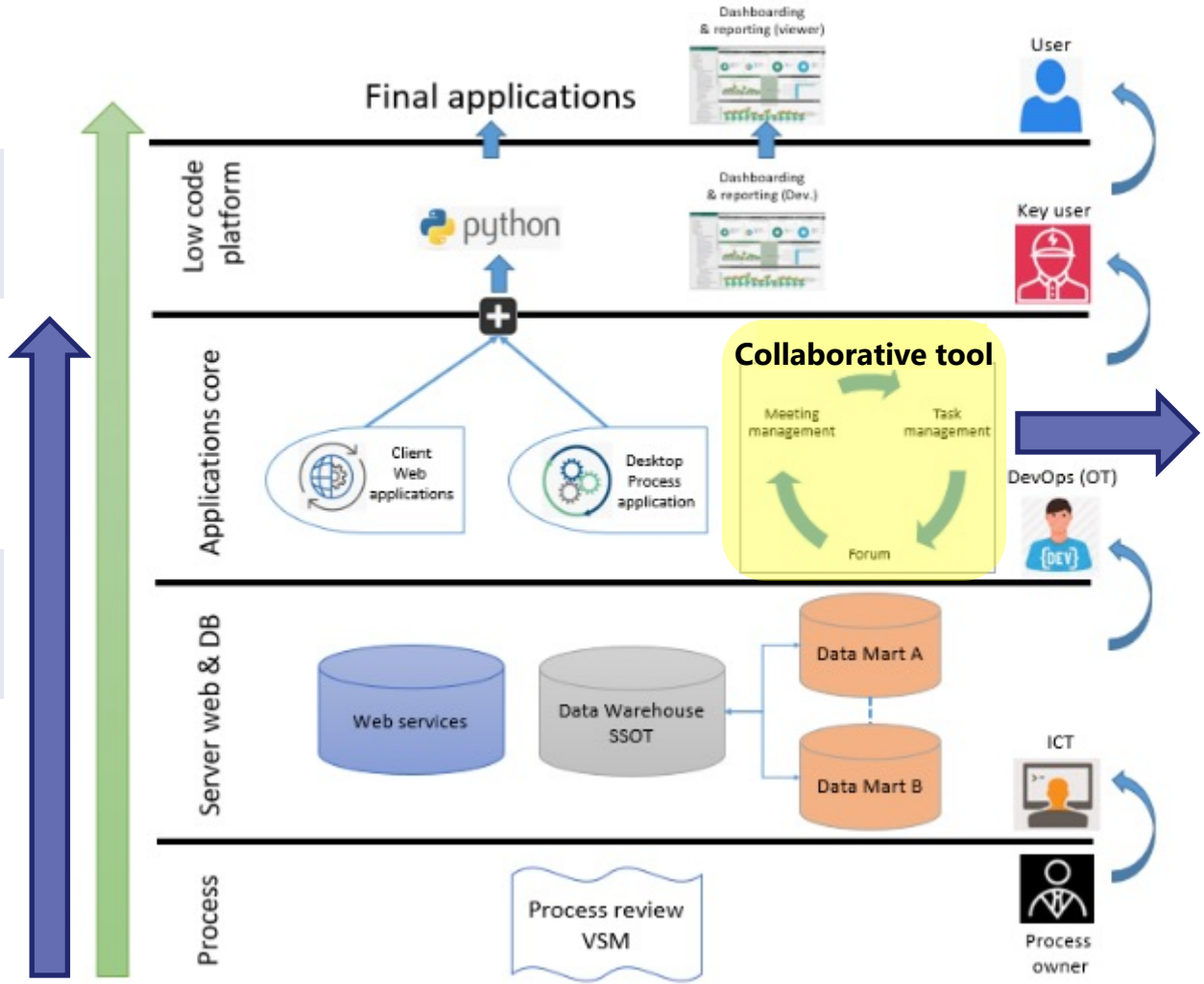


Our global 4.0 strategy is ongoing on a multi-year plan

Digitalization Strategy

Settings adapted by business for flexibility

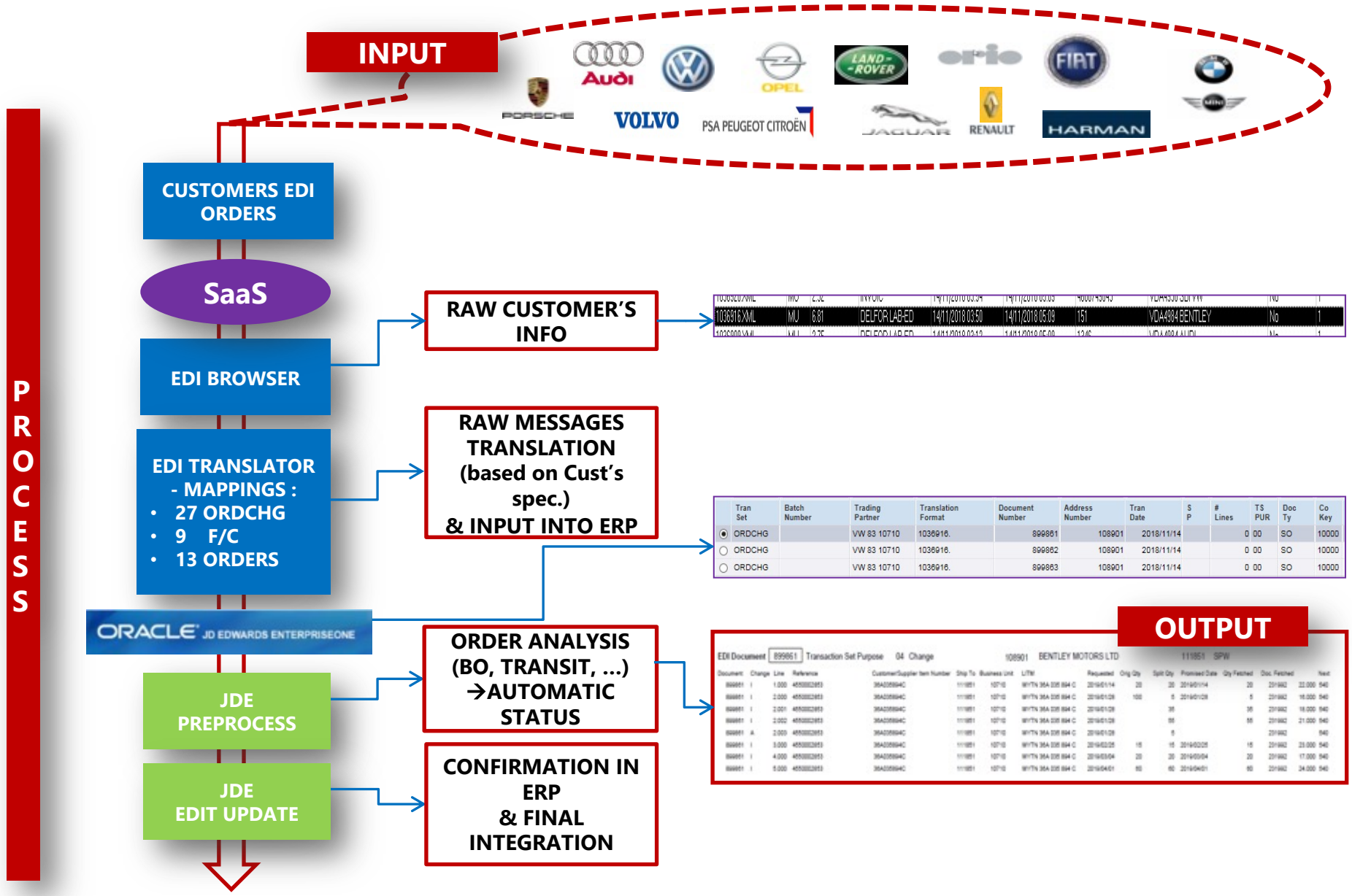
Core application developped by experts



Key solution to process decisions through organisation

Target :
Develop adapted solutions to each case through standard modules & robust data to support optimized processes

SUPPLY CHAIN 0 ENCODING EDI INTEGRATION

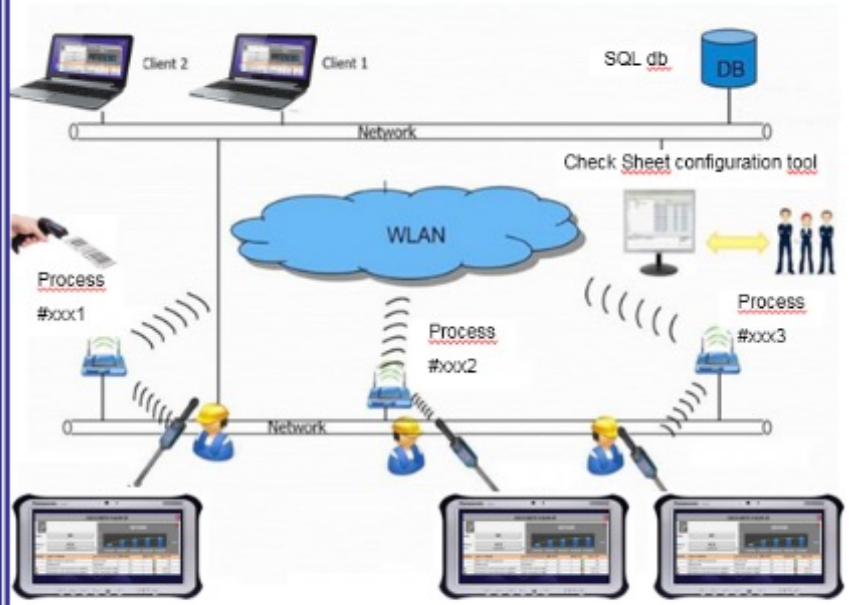


Project Overview & Targets

Adapt on computer the actal paper check by using a web application allowing to record the results of the check sheets but also manage and organise check sheets approval in electronical maner. Operator will scan the machine and fill the control list on a Tablet. Reporting will be automatic. Reminder and alerts will be raised by the system. Control method intructions will be directly available on tablet.

ACTUAL

AFTER IMPROVEMENT



Goals :

- Reduce Waste of time
- Improve accuracy

How :

- By implementing Electronic Check sheet
- By Reviewing Check sheet contents

Target :

- Implement June2019
- 100% of the check sheets reviewed
- 0 errors on checksheet
- Reduce 10% Operator time
- 0 deviation not reported

LMS : Learning Management System

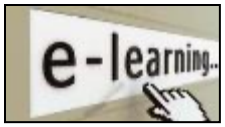
❖Purpose

- Develop a software for all AWEur Production Activities to manage Operators Skill Map
- Software full connected with other AW Eur processes

❖Improvement Reasons


- Operators Skill Map on Paper
- Manual Management / Risk of mistake / Time Consumin
- No link between Workstation and Skill Map status

❖LMS Advantages



- Full industry 4.0
- WI and TI linked with Operator Skill Map
- Skill Map linked with Workstation ➔ possibility to block Operator Acces to Workstation
- Online Training @ Workstation with I PAD / Time Saving and Training Level Upgrade

Before

Paper classification

Manual Info searching

Paper , sheets

After

Electronic documents

Good info first time with Scan

Tablet

END-TO-END engineering

Match customer demand with product & process design

Noise test implémentation in AWE

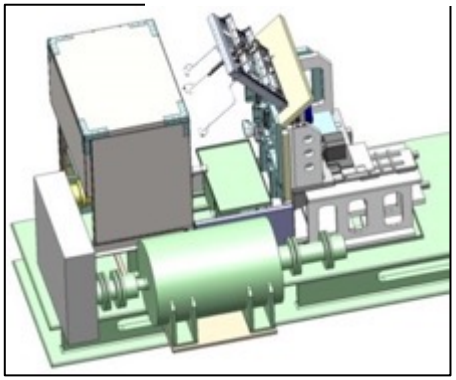
AW Europe
AWTC Europe

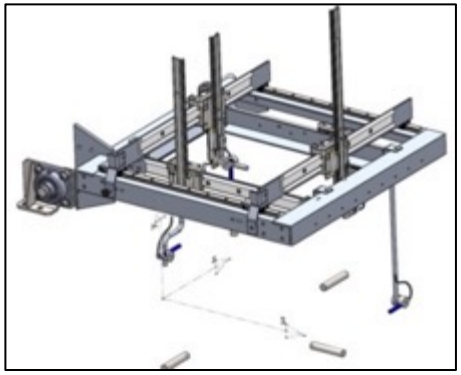
CITIUS ENGINEERING
Your partner for industrial projects

VOLKSWAGEN
GROUP UNITED KINGDOM LTD

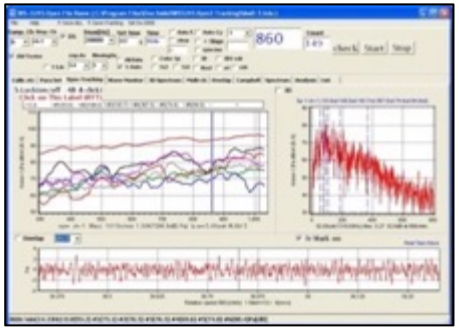
SEAT ŠKODA Audi BENTLEY

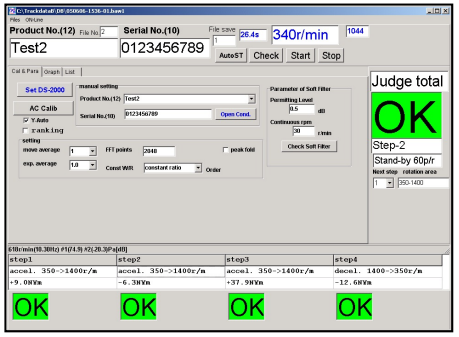
New customer requirement : Noise level assurance on transmission





In house technical study & manufacture subcontracting



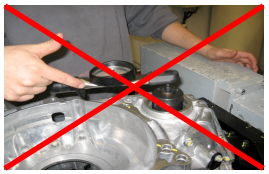


In house Test and validation

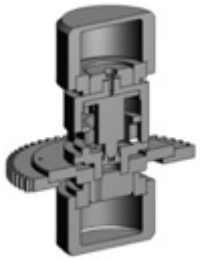
Correlate AW & customer measurements results to obtain customer approval

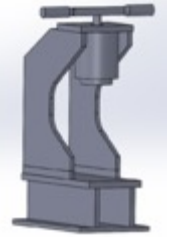
New Preload process implementation

New technical requirement : Differential Preload with much higher accuracy level



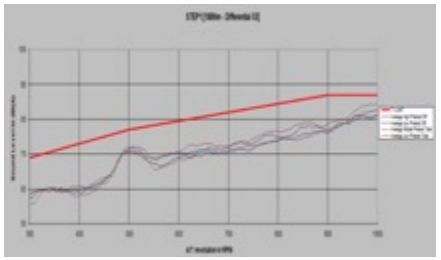
In house technical study





Parts machining (subcontracted) and in house assembly

Preload process validation by Noise test

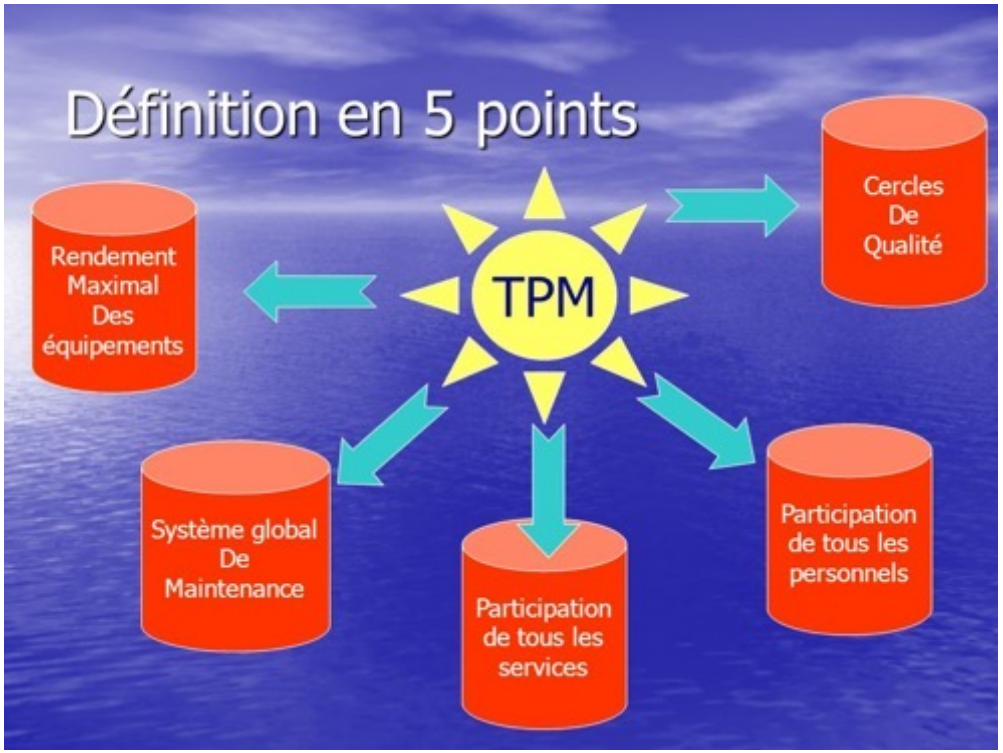


Project collaboration University

AW Europe
AWTC Europe

Collaboration Thèse :
Qualité Maintenance & Fiabilité

UMONS
Université de Mons



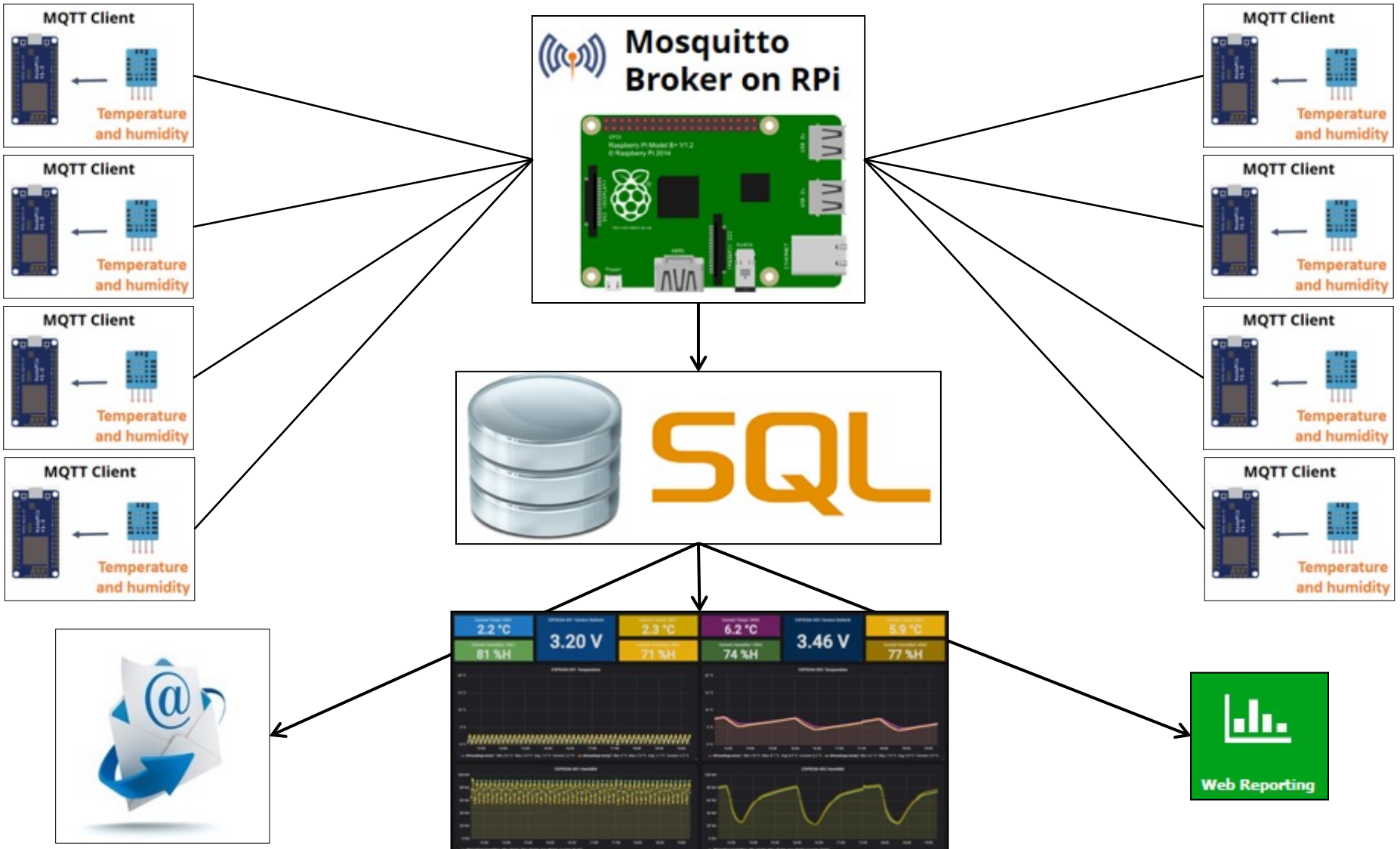
Project collaboration University

Collaboration Cobot :
Implémentation 1st Cobot AW Europ

WORLD CLASS PRODUCTION TECHNOLOGIES

Develop the best process to maximize LT result

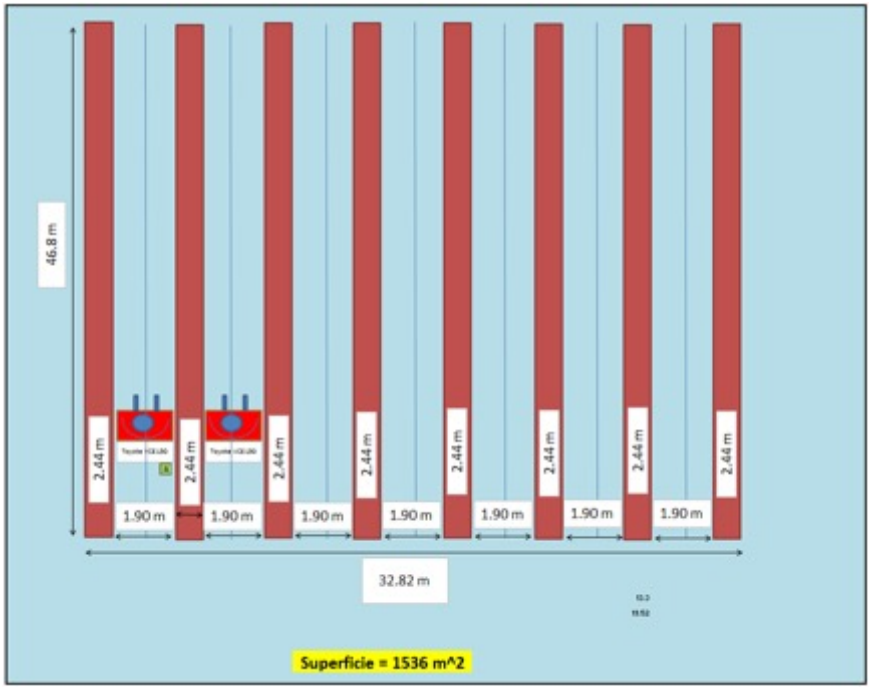
OP-18-0070-Overview
Capteurs autonomes : suppression checksheet frigos et armoires sèches



FILO vs RETRACT

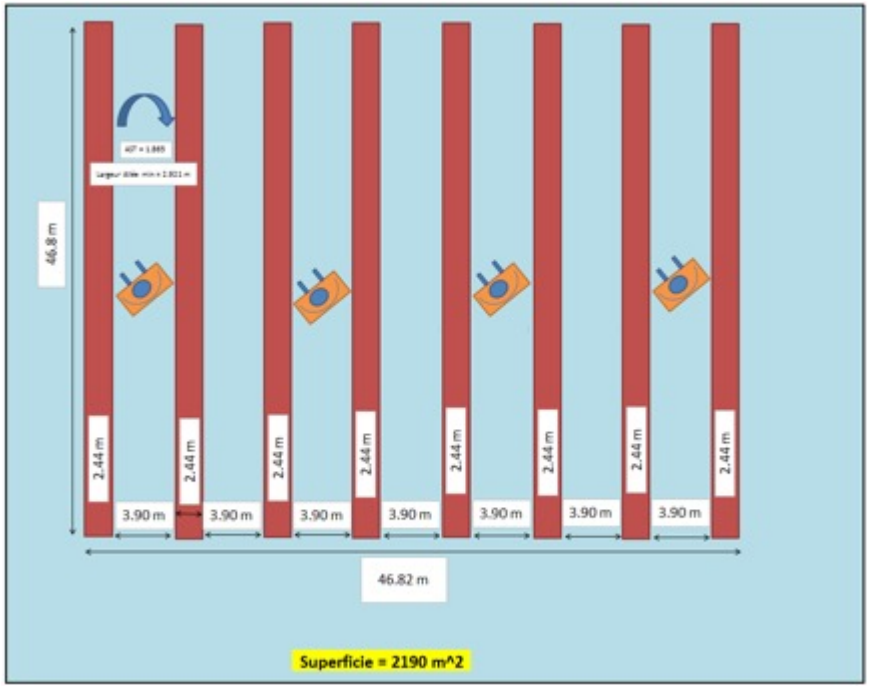
VCE 150

AST = 0 m
Largeur allée min = 1.90 m (largeur machine included Safety = 0.05 m de part et d'autre de la machine

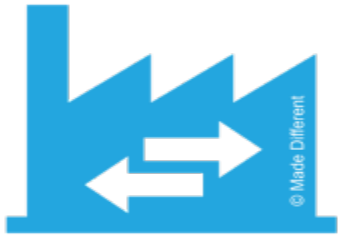


Retract type ETVQ

AST = 1.865 m (rayon de braquage)
Largeur allée min = 2.921 m
+ Safety = 0.5 m de part et d'autre de la machine / palette



Δ = 655 m^2



SMART PRODUCTION SYSTEMS

Kill non added value (task & sleeping time)

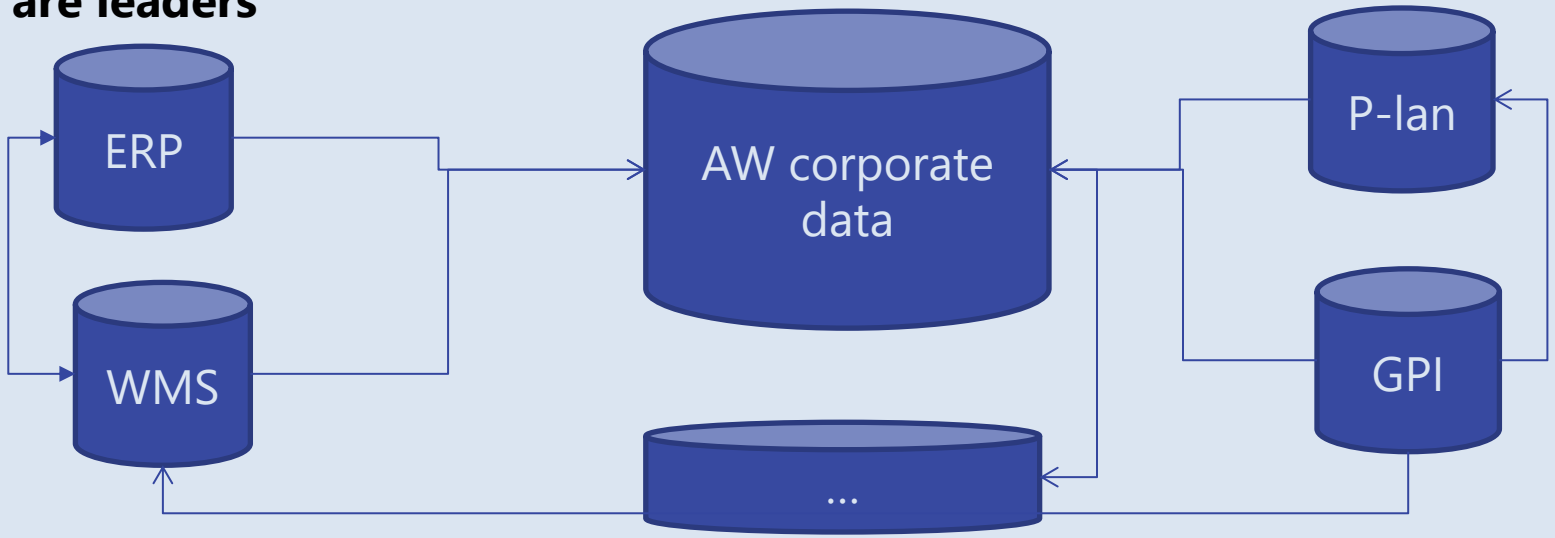
Generic concept

Operations are leaders

GMAO | LMS | E check sheet | Missions WMS | Alertes automatiques | Daily reports automatiques on Smartphone | Dashboards mgt | Customer demand, PO PP mgt | E kanban | Site sharepoint Forum | Container mgt tool

Mega tool?

ICT are leaders



DM are leaders

Date consistency control

ECO PRODUCTION

Protect the earth

Green Energy – Carbon Neutral Target

2012 Barge Transport

- Dock at 6 km from Mons Plant

TARGET

From 2023

New action: usage reduction or green production increase

2022 Windturbin

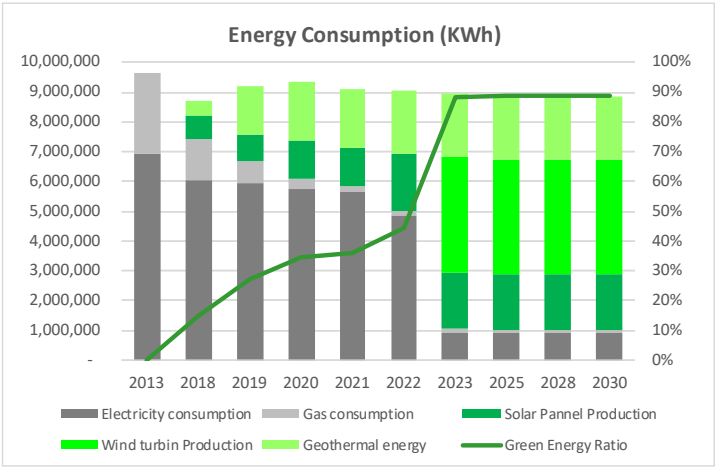
Saving of

- 540 Tons CO2/year
- 64% of our electricity consumption

2014 Geothermy

Saving of

- 424 Tons CO2/year
- 97% of our gaz consumption



2017 Solar Panel

Saving of

- 259 Tons CO2/year
- 31% of our electricity consumption

4300 panels

Others

- ISO-14001 Certification
- Waste Sorting
- Reuse Material
- Relighting
- BMS(Building Management System - regulation ➔ Fine tuning)
- Bio-diversity: Plant tree and flower meadow

2023 Solar Panel Parking

Saving of

- 172 Tons CO2/year
- 20% of our electricity consumption
- 950 kWc

HUMAN CENTERED PRODUCTION

Human drive our future

QC CIRCLE

What is it ?

What for ?

What are the main goals ?

- Aims to better workplace,
- Develop member skills,
- Increase customer satisfaction.

.

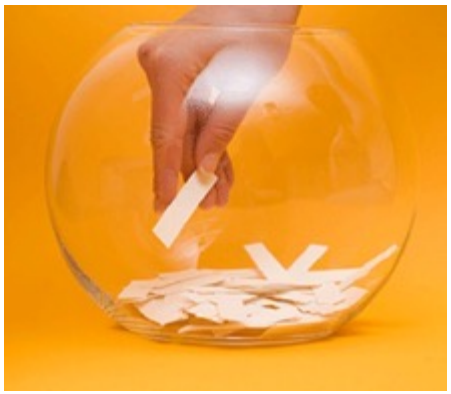
What kind of subject ?

Type of subjects:

- Problems identifications,
- Risk evaluations linked to the department,
- Opportunities for improvement.

SIMP

Employees' suggestions for improvement

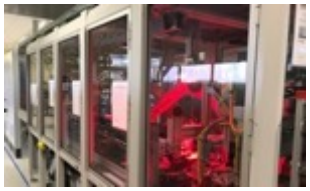


Draw Lot:
1X/Month

Selection :
1X/Quarter

Best SIMP Selection :
1X/Year

Electrical Plant Competencies



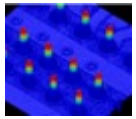



Competencies

Vision
Automatic Optical Inspection

- ✓ 3D PCB AOI

- ✓ 3D Xray AOI

- ✓ CN AOI

- ✓ Coating AOI

- ✓ Preship AOI – cosmetic insp.


Automation Robotization

- ✓ Multi axis

- ✓ Gantry

- ✓ Conveyor

- ✓ Screwing


Dispensing

- ✓ Glue
- ✓ Thermal Grease
- ✓ Coating
- ✓ Bi component

Software Dev.

- ✓ IA-algo dev

- ✓ Wifi/BT tester

- ✓ Embeded SW flashing
- ✓ HomeMade SW dev
- ✓ GPI / Big data
- ✓ Vision DLL dev

Electronics Mass Prod.

- ✓ Full Auto Reflow line

- ✓ Selective Soldering
- ✓ Cross section analysis

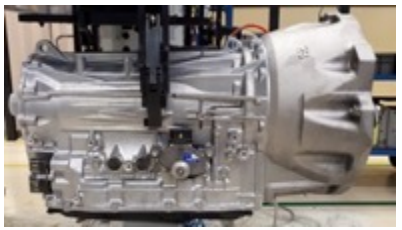
- ✓ Reability test
- ✓ IPC / ESD certification

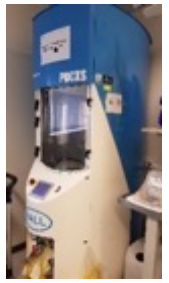
Powertrain Plant Competencies











Competencies

A/T, Powertrain & Sub-components Assembly

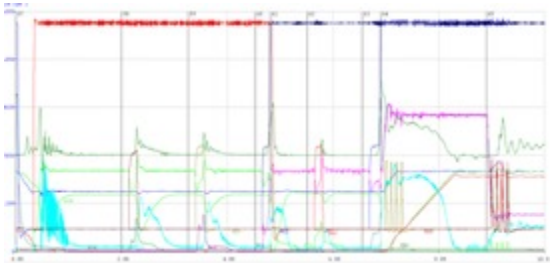
- ✓ Manufacturing Process Design
- ✓ Specific Tooling Design
- ✓ Specific Equipment Design
- ✓ Specific Process Design
- ✓ Wide sub-components Range:
  - ✓ Valve body
  - ✓ Gears:
    - Differential
    - Counter drive
    - Driven gears
    - Front & rear planetary
  - ✓ Oil pump

Production Control

- ✓ Contamination Control Management
- ✓ Dynamic PFMEA Review
- ✓ SPC / MSA to assure process capability
- ✓ Close monitoring, quick problem response and continuous improvement (N=1, 5Y, Ishikawa, 8D, QC Circle,...)

Testing

- ✓ Testing facilities designed in Japan that meet "OE" test requirements
- ✓ All product range: AT, Hybrid AT, V/B, Linear solenoïds
- ✓ Functional test
- ✓ Noise & Vibration test



Logistics Plant Competencies

Competencies



EDI Management

- ✓ EDI Management

Special Activities Management

- ✓ Quality Missions
- ✓ End of Line Activity


Customs Management

- ✓ Custom Clearance
- ✓ Inward processing
- ✓ AEO certified

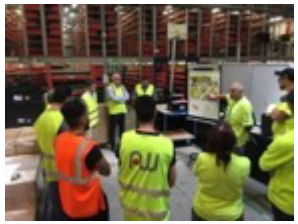
Packing

- ✓ Customer Packaging
- ✓ Packaging design
- ✓ Component customised packing and distribution

Shipping

- ✓ Mass Delivery
- ✓ Overseas Shipping
- ✓ JIT OE Plant Shipping
- ✓ Small and customized shipment

Safety Activities

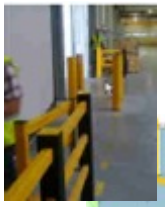




Safety Events

- ✓ Safety Animations
- ✓ Safety Days
- ✓ Safety Patrols
- ✓ Safety Communications
- ✓ Safety Detection Boards

Human Machine Separation




Lidar

- ✓ = Light detection and ranging
- ✓ Installed on our forklift


Safety Dojo's

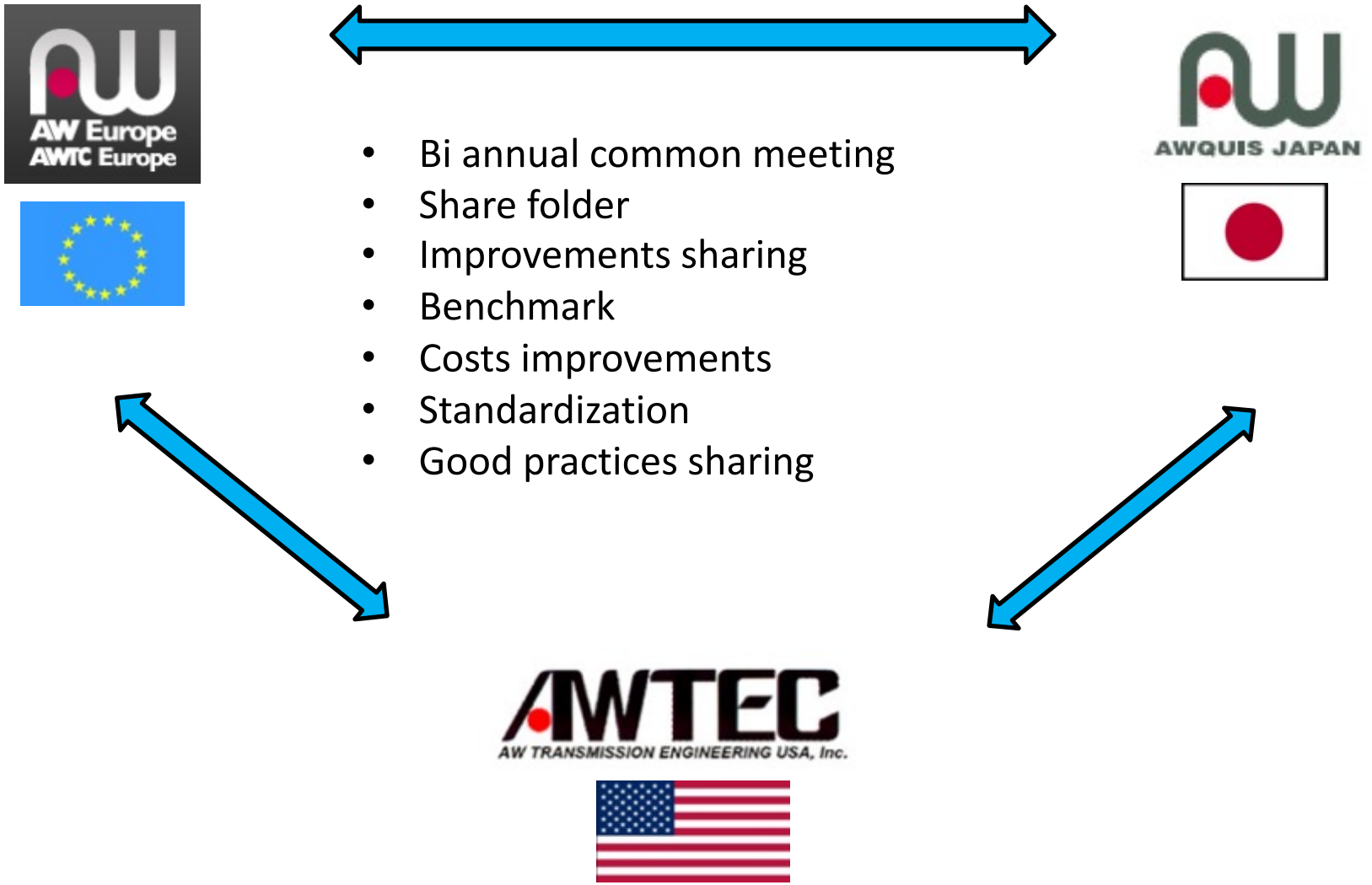
- ✓ Special training dedicated to safety


NETWORKED FACTORY

Gather & share knowledge to be stronger

Membres et participants à diverses organisations

3 sites meeting activities



- Bi annual common meeting
- Share folder
- Improvements sharing
- Benchmark
- Costs improvements
- Standardization
- Good practices sharing

Exhibitions

productronica

Each year / participation of AWE Engineering
(2 Eng. from MFEG / 2 Eng. from T.E)

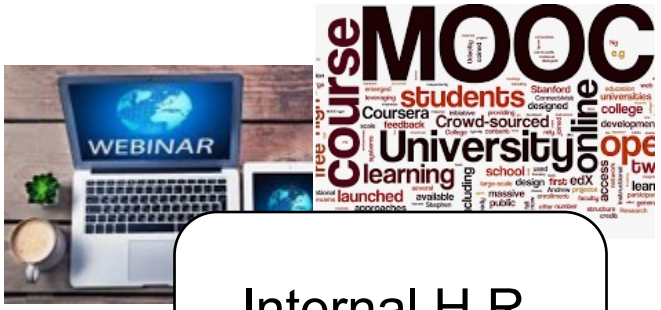
.AGORIA

Factory of the Future **in wording**

Engineering consultancy

Technologies sharing

Specific training



Internal H.R.
Catalogs

Thank you for your attention