



“WEBINAIRE INDUSTRIE 4.0”

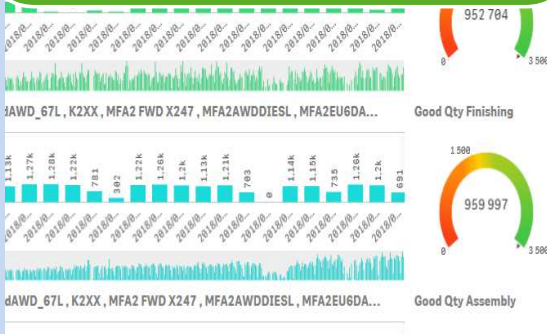
PHILIPPE CONVAIN

DIRECTEUR DIGITAL MANUFACTURING

DIVISION CLEAN ENERGY SYSTEMS - PLASTIC OMNIUM

Digital Manufacturing Objectives: Improve efficiency & profitability

PROCESS MONITORING & DATA MANAGEMENT

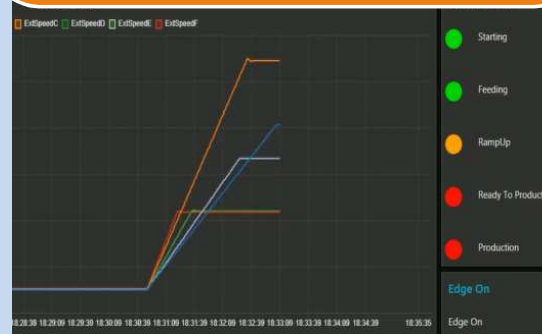


- Optimize development
- Supply chain efficiency
- Optimized shop floor

benefits

- Quality robustness (PPM)
- Faster reaction & plan (OEE)

PROCESS OPTIMIZATION



- Reduce scrap & usage
- Reduce downtime
- Predict maintenance

benefits

- Predictive Quality (PPM)
- Predictive Maintenance (Down time)

AUTOMATION & ROBOTICS

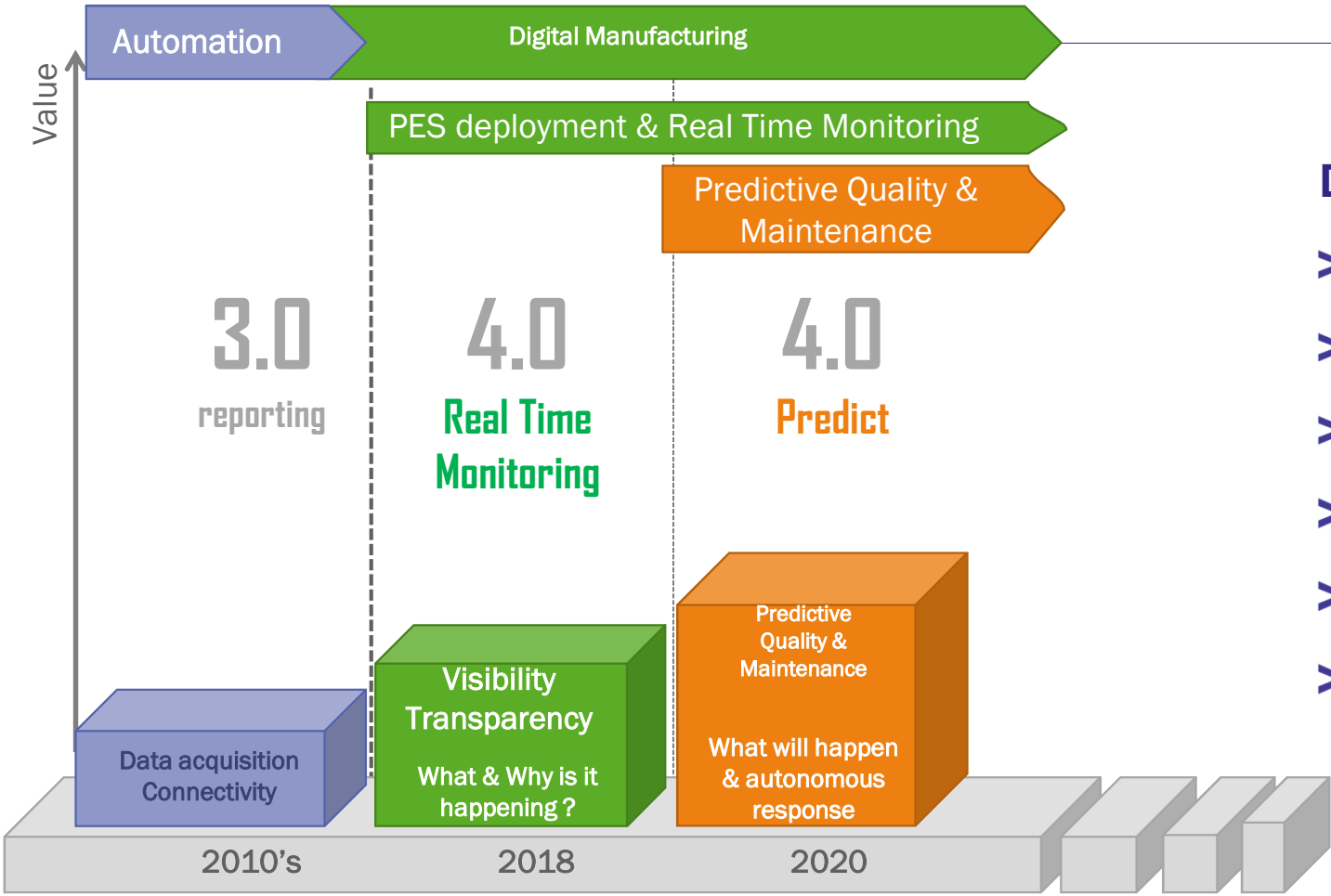


- Simplify automation
- Improve flexibility
- Save on CAPEX

benefits

- Flexibility (CAPEX, Inventory)
- Productivity (Direct Labour)

The route to Digitalization



Deployment in 6 main domains

- > Management
- > Supply Chain
- > Quality
- > Maintenance
- > Automation
- > Projects



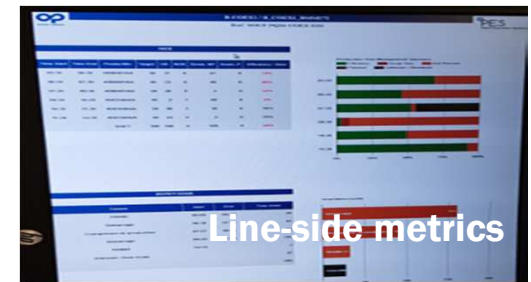
Visibility and transparency

Use DATA for better understanding and faster reaction

PES
(Plant Execution System)

Real Time Monitoring

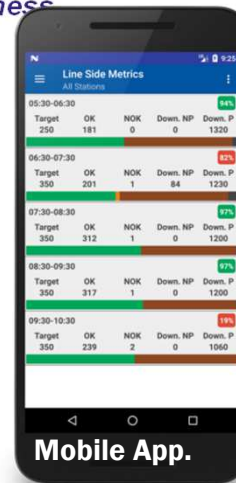
- Traceability/Quality check
 - Production declaration to SAP
 - Scrap & downtime root cause declaration
 - Archiving & reporting
-
- Andon Board / Line-side metrics
 - Touchscreen
 - Information availability and robustness



- Single source
- Transparency
- Faster reaction

Produ...	Workstation	OP. It...	Target	OK	NOK	On H...	Down...	Down...	Efficie...
FP-A9	B_KB252_BMM125	326	272	269	1	0	0	0	84%
X82	B_BA200_BMM160	326	272	276	0	0	0	0	101%
X82	A_PX82_PCK02	326	326	235	1	0	0	0	72%
X82	B_BA200_PCK01	326	272	248	0	0	0	0	91%
CMF1	F_CMF1MO_WIP01	97	81	4	7	0	0	0	4%
CMF1	F_PCMFJF_WIP01	323	323	370	0	0	3	0	114%
A9	F_TA9_PCK01	326	272	376	0	0	0	0	118%
A9	B_KB252_BMM125	326	272	269	1	0	0	0	84%
FP-A9	F_PA9_PCK01	326	272	270	0	0	0	0	99%
CMF1XF	B_KB256_BMM124	19	14	15	0	0	2	0	107%
CMF1XF	F_CMF1MO_WIP01	203	169	0	0	0	0	0	26%

Andon Board



Predictive Activities

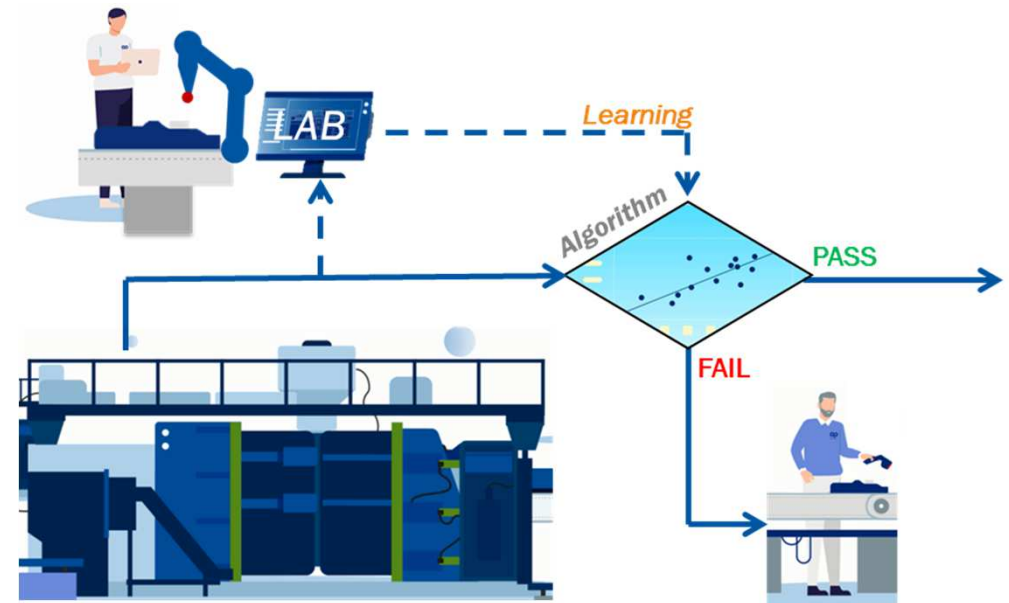
Build Models (algorithms) to improve process robustness and performance

Predictive Quality

- Associate quality & process data to build continuous DOE (Design Of Experiment)
- Use data from control plan execution for machine learning

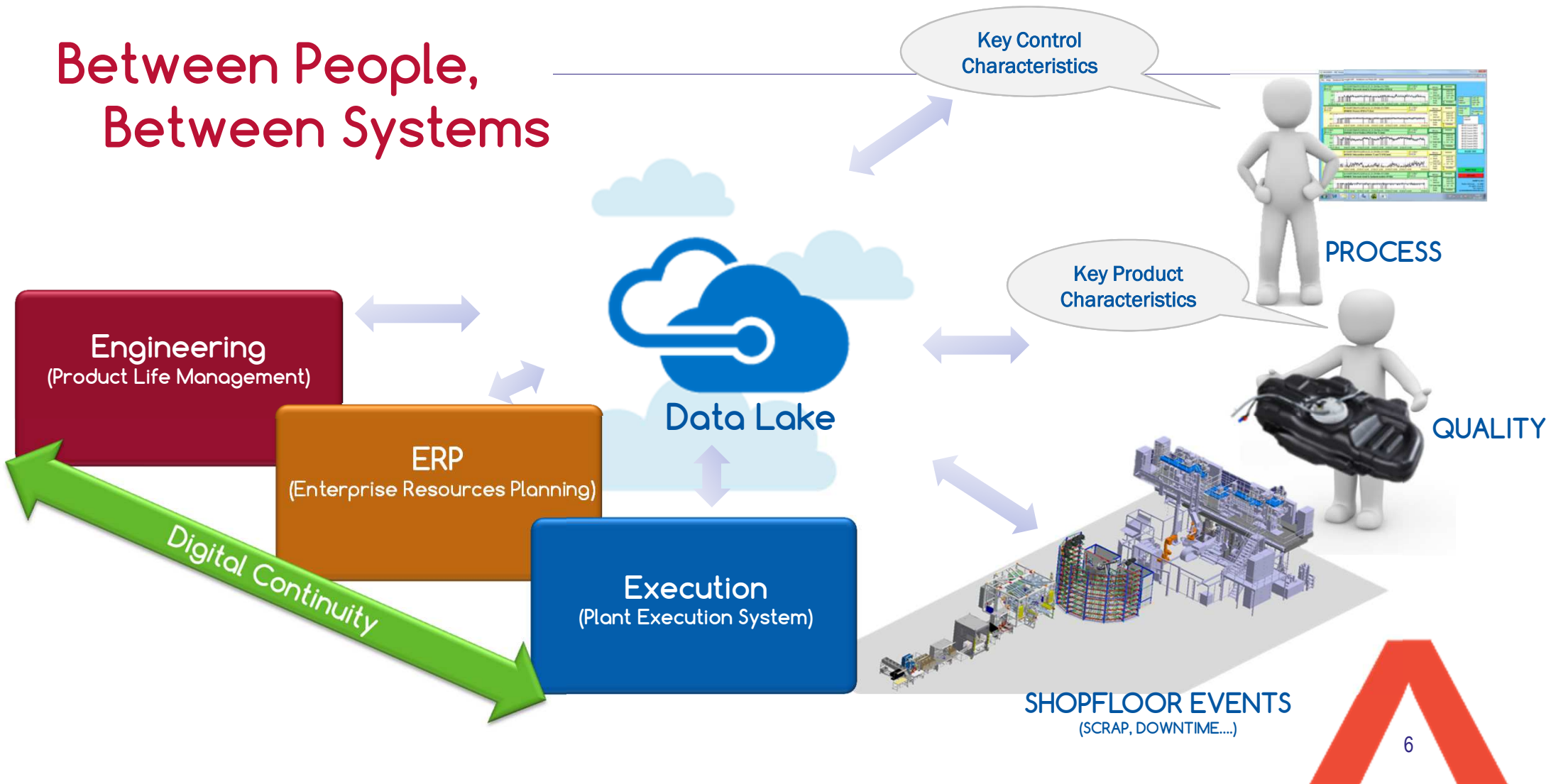
Predictive Maintenance

- Continuously assess machine health (current, vibration,)
- Connect to systems for alerting and correcting (maintenance ticket)



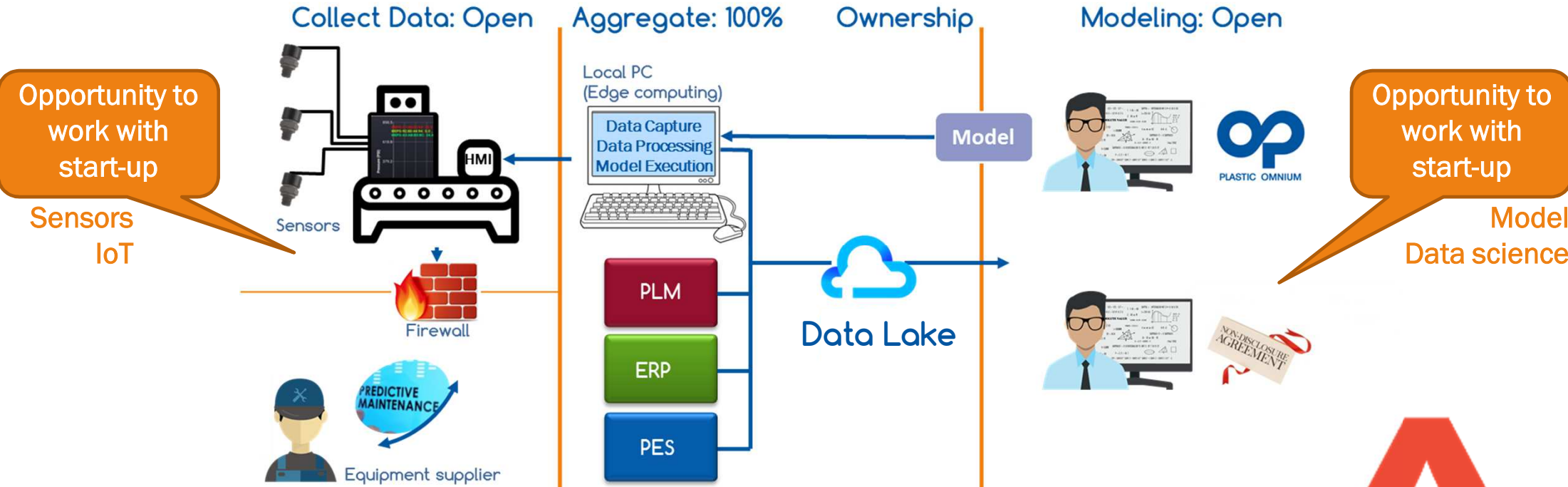
Value is coming from new Collaborations & Connections

Between People,
Between Systems



We remain the architect of the solution and keep the technical mastery

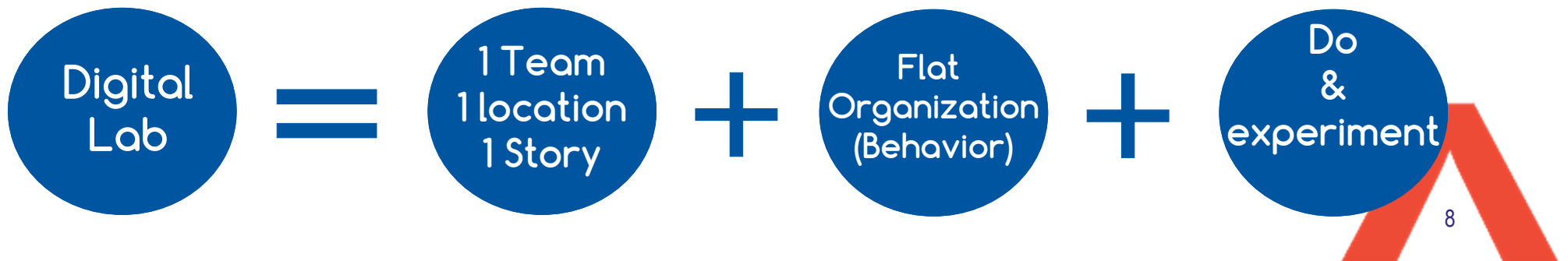
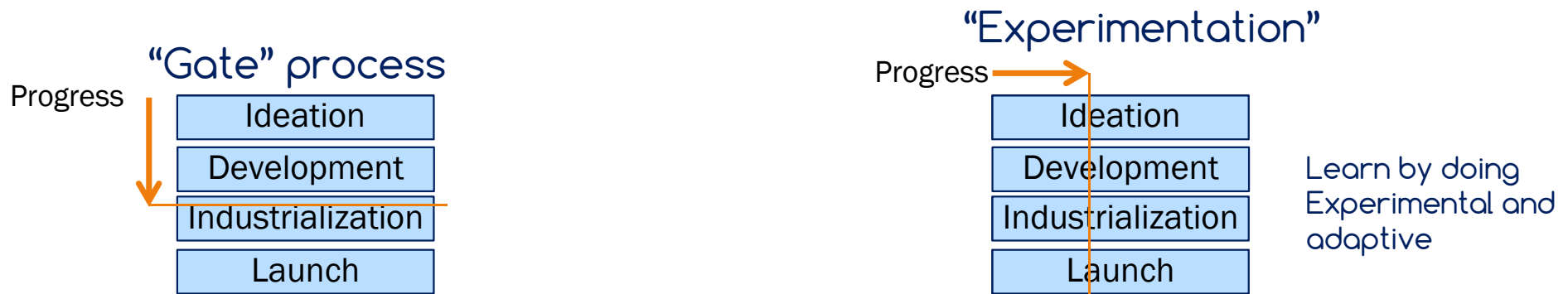
Common approach with IT & Industrial, to secure IP, Data, & knowledges



Develop a Digital Lab approach

Introduce “Experiment” phase:

- Often very far from being able to present a pilot, as we honestly don't know the ROI
- “Experiment” helps fill the gaps, but as the result is not sure, scope, cost and timing need to be limited, and approval must be quick and simple.
- It gives a second dimension to progress:



Collaborative Manufacturing launches a Virtuous Circle

