

# Demolish walls and silos in your organization through a digital twin approach

Ibermática

#### INTRODUCTION IN SUMMARY

Ibermática is a **global IT services company** that has been operating in the market **since 1973.** 

We contribute to the digital transformation of companies, institutions and organizations, helping them to improve their competitiveness through the application of technology and knowledge.



#### INTRODUCTION IBERMÁTICA IN THE INDUSTRIAL SECTOR

#### **PLATFORM BUILDER**

We build, integrate and deploy our own platforms and vertical solutions which have high configuration and parameterization capabilities.



#### **INTEGRATOR**

We integrate and implement leading platforms and solutions from the market, providing the specialized knowledge necessary to respond to the particular vision, needs and problems raised by our clients.







#### **OUR INDUSTRY 4.0 APPROACH ORGANIZATIONAL AGILITY**



June 2018

#### **DIGITAL TWIN**

**Digital twin** refers to a digital replica of physical assets (physical twin), processes and systems





#### OUR INDUSTRY 4.0 APPROACH INDUSTRY 4.0 ADOPTION PATH

#### **Digitization + Smartization**



#### Digitization

Creation of a virtual representation ('digital twin') of those elements that characterize a specific industrial business reality: **physical elements** (production line, machines, asset or facilities, materials, products...) and **logical elements** (project, process, services, etc.).



#### **OUR INDUSTRY 4.0 APPROACH INDUSTRY 4.0 ADOPTION PATH**

#### **Digitization + Smartization**



Creation of a virtual representation ('digital twin') of those elements that characterize a specific industrial business reality: physical elements (production line, machines, asset or facilities, materials, products...) and logical elements (project, process, services, etc.).

#### Smartization

Solutions that provide the capacity to interpret the reality through visualization and artificial intelligence, and the ability to act on it through microservices and applications.



## DIGITAL TWIN DIFFERENT EXPECTATIONS DEPENDING ON THE TYPE OF CLIENT





#### MACHINE / EQUIPMENT MANUFACTURER

MACHINE / EQUIPMENT USER



## DIGITAL TWIN DIFFERENT EXPECTATIONS DEPENDING ON THE TYPE OF CLIENT



Goals: selling spare parts, better service, new as a service models, feedback toTechnical office for product improvement



Goals: predict downtimes -> to increase availability Reduce defects -> to reduce rework & scrap

#### **PRODUCT AND PROCESS APPROACHES CUSTOMIZED ORDERS**



#### DIGITAL TWIN PRODUCT CENTERED



Virtual model with logic and data that allows the representation and simulation of the characteristics and dynamic behavior of a physical element, from its design to its use.



Greater products Better services

Ibermática

Modeling according to 'life cycle'

#### DIGITAL TWIN PRODUCT CENTERED







#### **PRODUCT AND PROCESS APPROACHES MASS PRODUCTION**



## DIGITAL TWIN PROCESS CENTERED



Modeling according to 'concentric functions'

#### Thing / Autonomous CPS:

Connected system with decision / action capacity (intelligence) in situations that can occur in the context in which it operates.



## Smart and connected factory:

CPPS - Cyber Physical Production System

#### - Integrated supply chain:

Suppliers, distributors, wholesalers, retailers and final customer.

#### Optimized production Increased automation



#### **PRODUCT AND PROCESS APPROACHES**

## **MASS CUSTOMIZATION**



#### RAMI 4.0 A STANDARTIZATION EFFORT

RAMI 4.0 covers the **different dimensions** of product and process approaches:



#### Life cycle of products

(design phases / type development, production / operation of instances)



#### **Hierarchy levels**

(Product, Device, Control, Workstation, Shop floor, Office floor, Supply chain)



**IT / OT Layers** (Business, Functional, Information, Communication, Integration, Asset)

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### Reference Architectural Model Industrie 4.0 (RAMI 4.0)



## Colaborat ONP

# Ibermática

## IK4 O TEKNIKER Research Alliance

PRODUCT AND PROCESS APPROACHES
DIFFERENT EXPECTATIONS DEPENDING ON THE TYPE OF CLIENT





#### MACHINE / EQUIPMENT MANUFACTURER

MACHINE / EQUIPMENT USER





#### FINGERPRINT MACHINES: DIAGNOSTIC MONITORING AND HEALTH PREDICTION





#### Fingerprint data:

Health signal of the machine that is extracted from a predefined test to model health, using signals and sensors that are installed in the machine.





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#### Prediccion Maquinas

Maquina	Estado	Texto Estado
LAGUN GML-5 T112	•	FAIL
LAGUN GML-5 T113	0	WARNING
LAGUN GML-5 T114	•	OK
LAGUN GML-5 T115	•	OK

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Mostrar 30						
Grupo Maquinas Criticas	Oee	Tiempo Funcionamiento	Tiempo Inactividad			
Grupo 1	86%	80%	86%			
Grupo 2	90%	85%	80%			



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	=					Cliente
	Evolucion de parámetros					
dro de Indos	Parámetros					<u>^</u>
	Máquina: ACME 6	Parámetros: Sp1MeanPow (w), Sp2MeanF -				Q
	Navegación					^
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		Nombre	Planta	Modelo	Estado	
		ACME 6	Location 001	502	•	
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	1					
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