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

- €235 million turnover
- €9 million profit
- €57 million equity
- 3,200 employees
- >20 branches
- 10% turnover from international operations
- 1 software factory
- 2 datacenters
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.

MANUFACTURING INNOVATION PLATFORM

SOLUTIONS
- RPS
- OLANET

FOUNDATION
ACCELERATORS 4.0
- Smart project management
- Predictive maintenance
- Quality inspection
- 3D assemblies
- OEE
- Analytics
- Condition monitoring

TECHNOLOGIES & FRAMEWORKS
- Entity, logic and interface generators
- Workflow
- Analytics
- Industrial IoT
- UI
- Data visualization

SAP Leonardo
OUR INDUSTRY 4.0 APPROACH
ORGANIZATIONAL AGILITY

Integration is at the heart of agile organizations

Source: based on Hackathon 2002; Muehlen/Shapiro 2010
Digital twin refers to a digital replica of physical assets (physical twin), processes and systems.
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

**Digital twin** (Integrated models)

Physical / logical elements of an industrial reality

Logical elements
- Business (tenders, orders...)
- Facilities / Factory
- Process / Project / OF
- Line / Machines / Components / Tools
- Items and materials
- Final product

Physical Elements (Things)

Virtual representation = Digital twin (Integrated models)

Digital Business
- Digital Facilities / Factory
- Digital Process / Project / OF
- Digital Line / Machines / Components / Tools
- Digital items / materials
- Digital final product

Digital items / materials
- Digital final product
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.).

**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.

OUR INDUSTRY 4.0 APPROACH

INDUSTRY 4.0 ADOPTION PATH

Queries and data visualization

Advanced analytics (patterns and predictions)

Interpretation and queries

Decision autonomy

Smart factories, products, software and machines

Digital Business

Digital Facilities / Factory

Digital Process / Project / OF

Digital Line / Machines / Components / Tools

Digital items / materials

Digital final product

Virtual representation = Digital twin (Integrated models)

Events and measures

Logical elements

Business (tenders, orders...)

Facilities / Factory

Process / Project / OF

Line / Machines / Components / Tools

Items and materials

Final product

Physical / logical elements of an industrial reality

Physical Elements (Things)

Feature Image
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 to Technical office for product improvement

**Goals:** predict downtimes -> to increase availability
Reduce defects -> to reduce rework & scrap
PRODUCT AND PROCESS APPROACHES
CUSTOMIZED ORDERS

Customized orders

PRODUCT

CUSTOM MANUFACTURING

TECHNICAL OFFICE

TECHNICAL ASSISTANCE

DEFINITION

DESIGN

PLANNING

PROCESS

MAINTENANCE

QUALITY

PRODUCTION

SERIAL MANUFACTURING

OFFICE FLOOR

SHOP FLOOR

June 2018
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.

Modeling according to ‘life cycle’
DIGITAL TWIN
PRODUCT CENTERED
PRODUCT AND PROCESS APPROACHES

MASS PRODUCTION
DIGITAL TWIN
PROCESS CENTERED

Smart and connected factory:
CPPS - Cyber Physical Production System

Integrated supply chain:
Suppliers, distributors, wholesalers, retailers and final customer.

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.

Optimized production
Increased automation
Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions

PRODUCT AND PROCESS APPROACHES

MASS CUSTOMIZATION

CUSTOM MANUFACTURING

TECHNICAL OFFICE

OFFICE FLOOR

SHOP FLOOR

PRODUCT

PROCESS

PLANNING

MAINTENANCE

TECHNICAL ASSISTANCE

PRODUCTION

DEFINITION

QUALITY

Significant customization of the products

Increased flexibility of manufacturing conditions
RAMI 4.0
A STANDARDIZATION EFFORT

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

**PRODUCT**
- **Life cycle of products** (design phases / type development, production / operation of instances)

**PROCESS**
- **Hierarchy levels** (Product, Device, Control, Workstation, Shop floor, Office floor, Supply chain)

**DIGITAL**
- **IT / OT Layers** (Business, Functional, Information, Communication, Integration, Asset)
PRODUCT AND PROCESS APPROACHES
DIFFERENT EXPECTATIONS DEPENDING ON THE TYPE OF CLIENT

MACHINE / EQUIPMENT MANUFACTURER

MACHINE / EQUIPMENT USER
Fingerprint
Operating signals of the machine:
For example, it collects speed, power and temperature data from heads and guides.

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.
Thank you

Alberto Sotomayor
a.sotomayor@ibermatica.com
+34 943 413 500