The Innovation Lab initiative: development of digital twin models and digital simulations to accelerate and make the machine, plant and product development phase more efficient

Presentation by
Gildo Bosi
Automation R&D manager
COMPANY PROFILE
SACMI is the leading international designer, producer and marketer of manufacturing plants and industrial technology for the ceramic and packaging sectors. SACMI has enjoyed market success for 100 years and is now a major Italian enterprise in terms of size, sales, areas covered and services provided.
LEADING THE WAY, WORLDWIDE
QUALITY OF BUSINESS, QUALITY OF LIFE

€ 1.256 BILLION
of sales revenue in 2019

€ 253 MILLION IN 5 YEARS
invested in Research & Development

4,500 REGISTERED PATENTS
along history, of which 3000 patents
registered by SACMI Imola alone

4,646 EMPLOYEES
of whom 1,240 operate abroad

INTEGRATED CERTIFIED SYSTEMS
for quality, safety and the environment abroad

INTERNATIONALIZATION & CSR
83% of turnover created abroad, over 2 million spent
along last ten years on sustaining the local community
SACMI BUSINESS UNITS

Tiles

Whiteware

Beverage

Advanced Materials

Closures, Preforms & Containers

Advanced Technologies

Packaging & Chocolate

Customer Service
TILE MANUFACTURING PROCESS

Smart Powder Plant  Smart Core Line  Finishing & Logistics
Digital Twin

- Product Digital twin
  - Virtual product
- Plant Digital twin
  - Virtual production: performance evaluation
- Real Plant
  - Production performance kpi
- Product
  - Product quality kpi

Process optimization

Product optimization

- Collaboration platforms (PLM, BIM)
- Digital Workflow
DIGITAL TWIN (DIGITAL WORKFLOW)

- Plant life cycle
  - Plant design
  - Production and maintenance
    - Production
    - Plant maintenance and improvement

- Design in the sales phase
- Concept design
- Detailed design
- Plant installation
- Plant start-up

- Virtual commissioning
  - Virtual training

- Integrated virtual commissioning and performance validation

- Product definition
  - Product def 1
  - Product def 2
  - Product def 3

- Product definition

- Plant optimization
DIGITAL TWIN

Recover manufacturing added value through digitalization
more than 300 controlled plants in the
DIGITAL TWIN

- Market scenario evaluation (what if analysis)
- Digital model
- Download production strategy - Plant optimization (operational scheduling, batch management, automatic set up change)
- Plant performance measurement (Real time data, machine learning)

Impianto reale
BUI LD  I N F O R M AT I O N  M O D E L I N G

BIM
DIGITAL WORLD

DIGITAL TWIN
DIGITAL WORLD + PHYSICAL WORLD

What is interoperability

Interoperability is a characteristic of a product or system, whose interfaces are completely understood, to work with other products or systems, present or future, in either implementation or access, without any restrictions.

you cannot have interoperability without open standards

Benefits:
• No vendor lock-in
• True cross collaboration
• Long support in life cycle

Source: https://www.bimmodel.co/single-post/2016/09/05/What-Interoperability-really-means-in-a-BIM-context
## Build Information Modeling

### BIM Coordinator
- The BIM coordinator has the skills necessary to manage and coordinate users and teams on a BIM project.

### BIM Specialist
- A BIM specialist contributes to a project by using advanced software modeling throughout the project’s full lifecycle.

### BIM Expert
- A BIM expert will learn the management of advanced BIM systems and their interoperability. The expert will also demonstrate IT manager skills, and will manage and develop libraries.

### BIM Manager
- The BIM Manager has the skills necessary for the management of collaborative teams and the implementation of BIM systems across all workstations.

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### SACMI

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**A2:** Model Documentation  
**A3:** Advanced Modeling  
**B1:** Collaborative Teamwork  
**B2:** 4D, 5D, 6D, 7D Interoperability  
**B3:** MEP/Struct. Interoperability  
**C1:** BIM Objects Development, BIM Libraries Management  
**C2:** BIM Style Guide  
**C3:** IT Management  
**C4:** BIM Systems Implementation  
**C5:** Information Management

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Integration of the laboratory on the territory: 'Create an innovation ecosystem'

The laboratory has the function of integrating the world of research with Sacmi industrial application sectors, bridging the gap known as 'death valley'
THANK YOU FOR YOUR KIND ATTENTION