Wishlist of an industrial manufacturing machine tools producer

DAVIDE GANDOLFI – ADIGE SPA - BLM GROUP

WORKSHOP NAZIONALE PER IL TRASFERIMENTO TECNOLOGICO E L’ALTA FORMAZIONE
LABORATORIO EMBEDDED SYSTEMS & SMART MANUFACTURING (ESSM)
17.06.2022
About BLM GROUP

BLM GROUP HEADQUARTERS
Cantù, Italy

BLM develops advanced integration & automation between tube processing technologies.

ADIGE CAMPUS
Levico, Italy

ADIGE manufactures tube laser-cutting systems and cold sawing machines for tube and bars. The product range also includes wire brushing, measuring, washing and collection systems.

ADIGE-SYS produces combination Tube and sheet laser systems, large diameter capacity Lasertube And end-machining tubes and bars equipment.

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BLM GROUP

Focus on internationalization
Sales and Service: close to you – wherever and whenever you need it
Focus on Research and Development

- 7% Of our income is invested in R&D
- 40 Active Patents
- 36 Collaboration programs with University and Research Centers
Application Fields

We provide manufacturing solutions for the production of existing and emerging products within the industrial marketplace.

Automotive - Indoor and outdoor furniture - Aerospace - Railway equipment - Architecture - Mechanical applications - Climate control - Cycles and motorcycles

Industrial and agricultural vehicles and products – Shipbuilding - Household appliances
TUBE BENDERS

- 16 models to meet any requirement
- Zero scrap
- All-Electric
- High repeatability
- Efficiency at maximum power
- Right-first-time
- Freedom of shape

BLM GROUP
LASERTUBE
CUTTING SYSTEMS
More than 2000 installations worldwide

Ø from 12 up to 610 mm
2D / 3D / 5D cutting
Tube & Sheet
Open and special profiles

10 models to meet any requirement
ALL-IN-ONE PROCESS

- Lowest cost per part
- Just in time production
- Right-First-Time
- Free design reach
BLM GROUP different technologies made for each other

The use of separate technologies has always caused difficulties. BLM GROUP machines are created to seamlessly marry these technologies taking into account the effects of each technology on the final product. All automatically.
BLM GROUP

Managing daily production

QUOTATION MANAGEMENT
Instant quotation
Right when you need it

PRODUCTION PLANNING
Interactive way to schedule
your production

PRODUCTION EXECUTION
Real-time process
control

PRODUCTION MONITORING
Ability to improve

Optimize the entire value chain

BLM GROUP
Focus on digitalization

**SERVICE**
- Predictive - Preventive - Corrective

**MACHINE**

**LOGISTIC**
- Optimal movement just in time

**OPERATIONS**
- Productivity - Efficiency - Quality
Dear Santa…

Laboratorio Embedded Systems & Smart Manufacturing (ESSM)

Trasferimento Tecnologico e Alta Formazione
Embedded Systems

• A typical system for industrial applications is made up of several “embedded” components.

• Despite different connection topologies, the most used paradigm is the controller/device (a.k.a. master/slave, depending on fieldbus)
Embedded Systems

- Hundreds (or thousands) of sensors are spread all over the machine, but they talk only to the controller and serve only one purpose.

- What if we could merge all the signals into a pool from which extract rich information?!
  - Predictive maintenance
  - Production process optimization
  - Anomaly detection
  - Faulty parts detection
  - …

The controller is (usually) not the proper tool  
→ waste of awareness

From https://support.industry.siemens.com
Embedded Systems

Our wish: to reverse the paradigm. The fieldbus communication should be broadcasted, moving from “point-to-point” to “publisher-subscriber”.

OPC-UA PubSub is a good candidate, but should meet real-time requirement of industrial fieldbus (see the recent rise of TSN).

We need “machine slaves” with this sort of communication options.

In this way, a PLC/CN can do its job while another unit (CPU/GPU) could mine the data through the help of machine learning algorithms.
Smart Manufacturing

BLM Group cares about the full production chain of its costumers. 1) we developed the “All-in-One” solution, for cutting+bending multi-machine process flow.

LaserTube can compensate Bender deformations… no need to act on CAD file!
Smart Manufacturing

BLM Group cares about the full production chain of its customers.

2) we developed a suite of SW tools for MES and ERP integration

Optimize the entire value chain
Smart Manufacturing

BLM Group cares about the full production chain of its costumers. 3) we go even further: we customize solutions with robots and automatic warehouses.
Smart Manufacturing

What is missing?! A standardization (among different producers) of:

- processing system model
- raw material, batches and parts “parameters”
  - geometrical (theoretical/compensated)
  - handling
  - status (correct/faulty/to be reworked/…)
- machine bus or I/O
- machine data
- …

Good to know, you are already working on it!

Is SysML a promising solution?!
Can we create standard «blocks» and API?!
Technology Transfer

No one can be a know-it-all. It’s hard to climb the (normally steep) learning curve!

We do not need rocket-science blueprints…

… we need rockets!
Technology Transfer

Technology Transfer is a process which must be carried out in collaboration between companies and institutions.

Laboratories and Applied Research Center can bridge the different focus (publications vs. revenue)

CINI, ESSM and ICE (together with other Italian excellences, e.g. SMACT Rovereto) are rapidly reducing the gap with the “german model” (see e.g. ARENA2036)

LET'S START BUILDING ROCKETS!
Thank you!!