

1. Challenger companies

Algon EEM, ASTIGARRAGA KIT LINE, IRURENA GROUP (Robtrusion)

2. Challenge

How can data from different production lines and their machines be extracted, stored and monitored in a uniform and centralised way? And how can machines be given new capacities to increase their intelligence?

3. Possible applicable solutions

- Sensor systems and IoT visualisation platforms
- Big Data platforms
- Artificial intelligence for machines

4. Background:

The 3 challenger companies in question belong to the **furniture and equipment sector**; they have pinpointed 2 opportunities **to improve their production processes by means of applying new digital technologies**.

Algon EEM specialises in the manufacturing of metal tubular structures, mainly to be used in the furniture industry, but also for the automation, industrial and medical sectors. Its production process is organised into different manufacturing lines that include cutting, bending, welding, and polishing, painting and drying the final products, along with their quality control.

Astigarraga Kit Line designs, manufactures and distributes trestles, bottle racks and furniture made out of solid pine wood. As far as its production activity is concerned, the sawmill operations are separate from the different activities to produce furniture. In this second line, the company develops and uses a whole range of machines for working the wood, such as planer thicknessers, moulders, sawing machines, etc.

Irurena, in turn, designs and manufactures organic coatings to treat different substrates (wood, metal, plastic, etc.) for the timber, industry, interior design and DIY sectors. The company through its spin-off Robtrusion has recently been working on developing a unique technology (a curved pultrusion machine) for the automated production of curved fibreglass profiles (light composites with excellent mechanical properties) focused on the shipbuilding and automotive industries, and civil infrastructures. Unlike the first two companies, it does not have an industrial line and is involved in the final development phase of the product.

5. Sub-challenges and targets

It should be noted that Algon and Astigarraga Kit Line have industrial plants with a mix of the latest machinery models with older ones, and with the manual work of the operators. They both operate in a context where they work with a large number of product references and turnover, and where each has different associated industrial processes. The first challenge consists of successfully **improving and monitoring the functioning of the machines and their interaction** to:

- Manage the sequencing and planning the machine load for the better usage
- Improve the product change processes linked to changes of machinery and equipment
- Identify the shortfall costs and labour gaps in real time

The constraints of this first challenge would be:

- The existence of machines that lack sensor or data collection systems
- Equipment from different sources and age
- The real productivity of the machines is measured by the data entered using the job orders

The following technologies would therefore be appropriate:

- Sensorisation of different machinery for data capture**
- Big Data platform for data storage**
- IoT visualisation platforms**

As regards Irurena, and turning to the second challenge in question, the company wants to **integrate intelligence in the machine** in its development of its pultrusion machine, and to successfully:

- Maximise its productive capacity by means of determining (based on historical data) the optimum set-up for each process in which it is applied
- Control the production quality to avoid rejection costs, along with ensuring own quality standards for the profiles, particularly for highly demanding sectors
- Process all the production indicators and metrics in a smart and automatic way

Some of these technologies are considered of interest:

- Artificial Intelligence** for processing and obtaining different patterns
- IoT visualisation platforms**
- Sensor systems or other technologies** for the structural analysis/physical interpretation of machines/components