1. Entity posing the challenge:

- **TIVOLY, IBARMIA, IZAR, LANTEK, LAZPIUR, COMETEL, ONA, DIMECO**

2. Challenge statement

Quality control enabling technologies

3. General context

The manufacturing industry is facing a new global context meaning the model must be reconsidered in all areas. This implies a structural challenge with profound operational, technological, and cultural implications throughout the value chain.

In this new context, and mainly thanks to greater data processing and storage capacity, greater maturity, and improved applicability to industrial environments, the traditional product is moving towards connected products. Greater importance is being placed on additional services linked to this product, which is opening the door to disruptive models that evolve from the sale of the asset, to the sale of the use of this asset.

This digitalisation of the manufacturing industry opens up possibilities to improve each stage of the industrial process, generating a direct business impact and providing an opportunity to improve both productivity (cost efficiency) and to develop new products and services which increase competitiveness (added value for the customer).

AFM Cluster member companies in general, and Uptek in particular, are directly involved in the context described above. Their activities are directly related to:

- Development and commercialisation of software solutions for the M-H sector
- M-H manufacturing applied to different processes (milling and boring, electrical discharge machining, cutting, punching, bending, etc.)
- Manufacture of tooling and spare parts

In terms of products, it should be noted that these companies have a heterogeneous business model. Some of the companies focus on standard products and others on customised products and even turnkey projects.

While there is a considerable difference in the production processes of these companies, they face certain common challenges at the internal operational and product level that can be addressed through 4.0 technologies.

4. The Challenge

1. **Description of the challenge:**

Assuming that the quality of the product as well as its connectivity and monitoring capabilities are a prerequisite to making a sale, and that global competition and comoditisation displace the machine's sources of value and benefits, incorporating disruptive technologies in the machine is increasingly important and valued.

The knowledge required to develop these disruptive technologies is a barrier to entry for machine tool manufacturers as, on occasions, it is knowledge that is far removed from the core of their business.

The technologies under discussion are mainly linked to the quality control of the manufactured part: Computer Vision, Electromagnetic waves, Colorimetry, Thermography, Ultrasonics, X-rays, etc.

2. **Main impacts:**

The incorporation of these technologies will have a temporary window of opportunity before becoming standardised in the market, during which time their incorporation will have a direct impact on the final asset price.

One of the main impacts in terms of the incorporation of these technologies is the ability to scale the solution to the set of products offered by the companies in order to avoid unitary developments in each project.

3. **Main questions to be solved:**

- Would it be possible to carry out "unitary" quality control based on...
  - ...Computer Vision?
  - ...Electromagnetic waves?
  - ...Colorimetry?
  - ...Thermography?
  - ...Ultrasound?
  - ...X-rays?
  - ..Others?

4. **Expected technological solutions**

The technological solutions expected to address the above challenges are:

1. "Unitary" quality control technologies (Computer Vision, Electromagnetic waves, Colorimetry, Thermography, Ultrasonics, X-rays, etc.).