# The Challenge

The company consists of three divisions. The company specializes in the production of timing chains and timing modules with variable phases as well as the production and regeneration of turbochargers. In addition, it has a technical center.

The challenge is to automate the washing of components during the production process instead of manual washing. Currently, before starting the welding operation, the operator must wash the components with a handheld steam cleaner and then dry them with compressed air. To streamline the process, the operator proposed a solution in the form of an automatic washer. The machine will be placed next to the welding machine. The components will be placed in the appropriate tooling and after pressing the button, the washing and drying process will start. At the same time, the operator will operate the welding machine.

By connecting the washer to the system, it will be possible to monitor the work in real time.

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## Main Requirements

* Optimization of production time.

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## Other Requirements

N/A

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## Key Performance Indicators

N/A

**Industry Sector:**
Automotive industry

**Challenge classification:**

Real-time process monitoring and optimization.

**Time for Project Completion:**

1 month

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## Other informations

Use manufacturing execution systems (MES) or enterprise resource planning (ERP) systems?

Yes.

Type and operation of the MES or ERP system used?

SAP is the main system controlling the flow of materials, components, and finished products in the company. It is also used to manage technical documentation.

Machines are equipped with PLC/PAC or CNC controllers and can provide data?

All machines are equipped with PLC/PAC or CNC controllers and can provide data (e.g. component DMC codes). There are communication protocols, sensors, or devices with which the solution needs to integrate.

# Research Phase

*Taking into account the challenge description, its requirements and its information, elaborate at least 5 questions that can lead your research for a solution.*

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## Research questions:

*Given the questions and the main requirements of the challenge previously listed:*

* *identify possible technologies using the Planet4 Taxonomy Explorer;*
* *identify and analyze the sources (papers, articles, etc.) of those technologies that best suit the challenge;*

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## Technologies identified in the taxonomy:

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## Sources of those technologies that best suit the challenge:

*In light of the discoveries made:*

* *report the answers for the questions above;*
* *compare 2-3 of the more common solutions identified in the sources (how would they change the approach to the solution? What are the possible benefits/issues in such a use of these technologies?);*
* *draw initial conclusions on which path you want to take in proposing a solution.*

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## Answers:

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## Comparison:

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## Conclusions:

# Proposed Solution

*Making use of the technologies identified after the analysis of the sources, describe a possible solution to the challenge. Also, do not forget the constraints (time, number of devices to produce/connect, etc.): the solution must be applicable to the real context of the company that commissioned the challenge.*

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## Solution Summary

*Brief description of the solution (1-2 paragraph + 1 image)*

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## Solution Description

*Describe the solution and its details*

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## Implementation Plan

*Describe the solution implementation plan considering among other things: gantt chart with milestones, high-level cost analysis, possible difficulties (at least 3 major issues or difficulties) and additional opportunities (at least 2 extra benefits).*