# The Challenge

The company has about 150 machines equipped with PLC/PAC or CNC controllers that can provide data. About 30 machines will be connected, as the company is still growing. New production lines are installed successively. Machines, using pneumatic actuators, move, apply, transfer components, and then the finished product is assembled step by step, i.e. a DC 12V motor.

The company’s challenge is downtime, which is caused by machines that repeatedly jam and move. Support from maintenance technicians is very much needed here. It is up to the technicians to a large extent to determine how much a given machine will be in the downtime phase. It should be noted here that every minute of downtime is a loss to the company. Detection of early signs of machine failure would avoid longer downtimes. A faster response of employees to machine errors could also affect machine downtime.

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## Main Requirements

* Reduced machine downtime.

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## Other Requirements

N/A

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## Key Performance Indicators

N/A

**Industry Sector:**  
Automotive industry

**Challenge classification:**

Detection of early signs of machine failure would avoid longer downtimes. A faster response of employees to machine errors could also affect machine downtime.

**Time for Project Completion:**

15 months

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## Other informations

Number of machines to be connected:

About 30

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

About 150

# 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).*