# The Challenge

The challenge concerns a large company that produces tires and tooling for the production of tires. The problem described takes place in a department with 30 machines, all equipped with PLC/PAC or CNC controllers and able to provide data. The workplace affected by the challenge is an automatic painting station (one workplace in the department).

The challenge is to replace the manual selection of the paint recipe with an automatic selection that will occur after the operator scans the barcode assigned to the product. Due to the fact that currently the selection is made manually on the panel and the operator still has to scan the barcode, this would shorten the time needed to make one piece. After selecting the appropriate program, painting will start. The process will be repeated individually for each piece delivered to the workstation. For proper operation, IT support is needed to connect the machine controller to the system containing the barcode data.

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## Main Requirements

* Improved machine utilization,
* Optimization of production (time needed to make an item).

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## Other Requirements

N/A

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## Key Performance Indicators

N/A

**Industry Sector:**
Tire industry

**Challenge classification:**

Monitoring and optimization of processes in real time; Improvement of work ergonomics by eliminating the need to leave the workplace to the main panel when changing the assortment.

**Time for Project Completion:**

6 months

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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?

The MES system allows one to record information about each piece of product made by employees and operations on it in a specially created application. In addition, thanks to the use of barcodes, each product has a history of performed operations (date, data of components from which it was made, and operator responsible for a given process). There is no possibility to generate reports, automatic KPI measurement - the application is very limited in relation to the full-fledged existing MES systems. The system was designed for one department.

Number of machines to be connected:

1 machine to connect. The solution to the challenge must integrate with the robot's PLC and the department's barcode system.

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

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# 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).*