# The Challenge

The company has 7 machines: 2 fiber lasers, 1 CO2 laser, 1 CNC folding machine, 2 manual band saws, 1 lathe, including 4 CNC machines.

The challenge is to streamline the business in terms of work time and product quality. A big problem is late shipments, often caused by a lack of organization and order. Currently, the 5S principles are being implemented, which will improve the organization of the workplace. The company is seeking to improve production control by allowing employees to enter work progress into an existing system. This will allow management units to quickly and easily control the process and help determine how long the order will take. Thanks to this, it will be possible to agree with the customer on the appropriate date for the delivery of the goods.

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## Main Requirements

* Production flow monitoring,
* Optimization of production planning and scheduling,
* Improved machine utilization,
* Reduction of machine downtime,
* Optimization of material flow.

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## Other Requirements

N/A

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## Key Performance Indicators

N/A

**Industry Sector:**
Manufacturing of metal products

**Challenge classification:**

Monitoring and optimization of processes in real time; Intelligent planning and scheduling of processes; Organize and control workloads using shift work schedules and data analysis; Improving the transparency and reliability of the supply chain.

**Time for Project Completion:**

12 months

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## Other informations

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

No.

Number of machines to be connected:

4

Configuration of each machine and the operation of each:

All CNC machines will be connected to a network system that will automatically count and save data from the machine regarding working time, downtime, and manufactured elements, which will automate production. Tools to report problems will be introduced into the system, so these problems will be eliminated in the next production series.

# 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).*