ONE4ALL PROJECT

Agile and modular cyber-physical technologies supported by data-driven digital tools to reinforce manufacturing resilience.

This project has received funding from the Horizon Europe Programme of the European Union under Grant Agreement n° 101091877

Why manufacturing must adapt

Demand	Adjust how much the line produces.
Product mix	Introduce new products on existing lines.
Order priorities	Reschedule work as priorities and capacity change.

> **THE COST OF CHANGE**
>
> Each adjustment takes time and resources.

What adaptable automation requires

01 **See what is happening**

Bring data from separate production stages together for process monitoring and quality checks.

02 **Decide what happens next**

Use timely information about orders, priorities and capacity to adjust the plan.

03 **Carry out the new task**

Coordinate robots, sensors and existing equipment, and adapt how materials are handled.

One product logic across the value chain











CONNECT

Link equipment, sensors and data.

DECIDE

Orchestrate missions and adapt to change.

ACT

Configure modules to carry out the task.

A human-centered approach underpins ONE4ALL

How the tools work together

Intelligent Orchestration Platform (IOP)

Connects data services, applications and shop-floor equipment.

Shop-floor work

RCPM
Robotic arm and mobile robot

AI perception
Analyse RCPM data

Planning and monitoring

Decision Support System
Revise plans as priorities change

Digital Twin
Monitor the production system

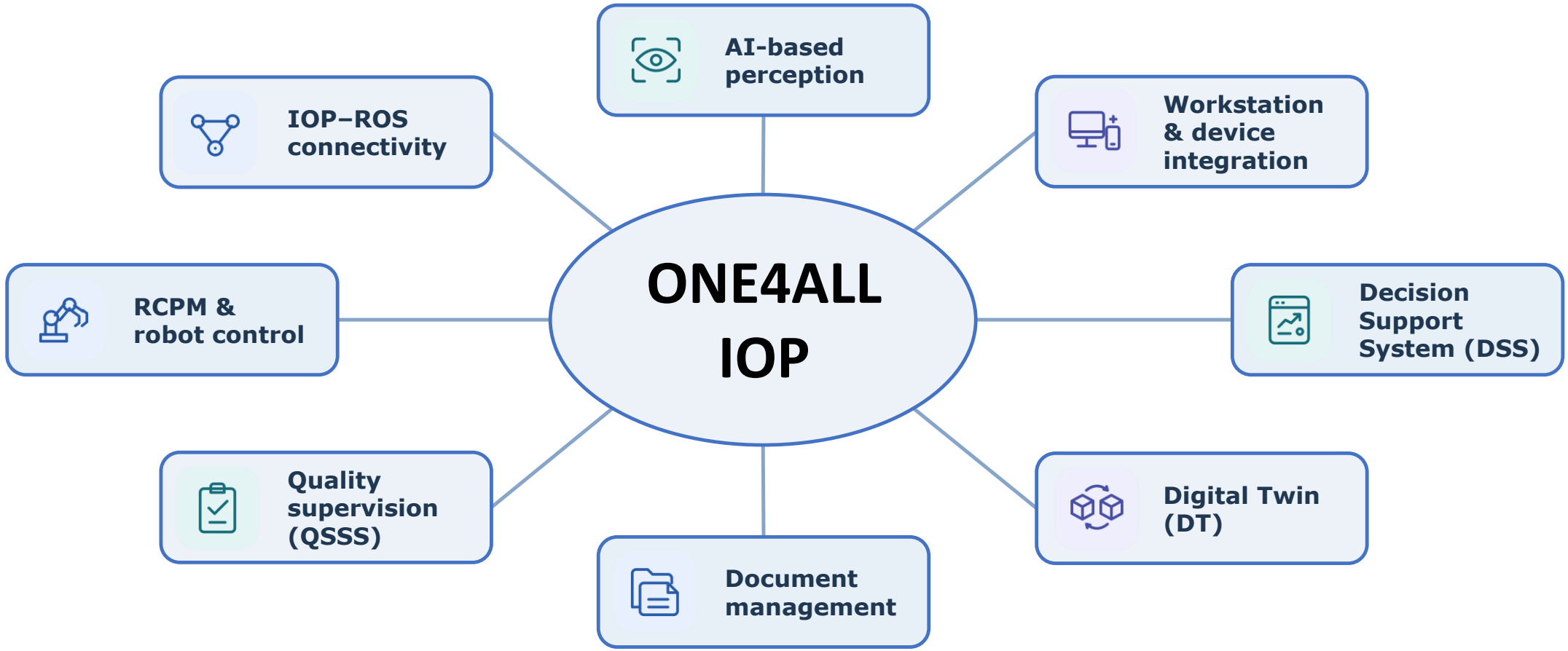
Workstation integration
Sensor and device connectivity

Quality and records

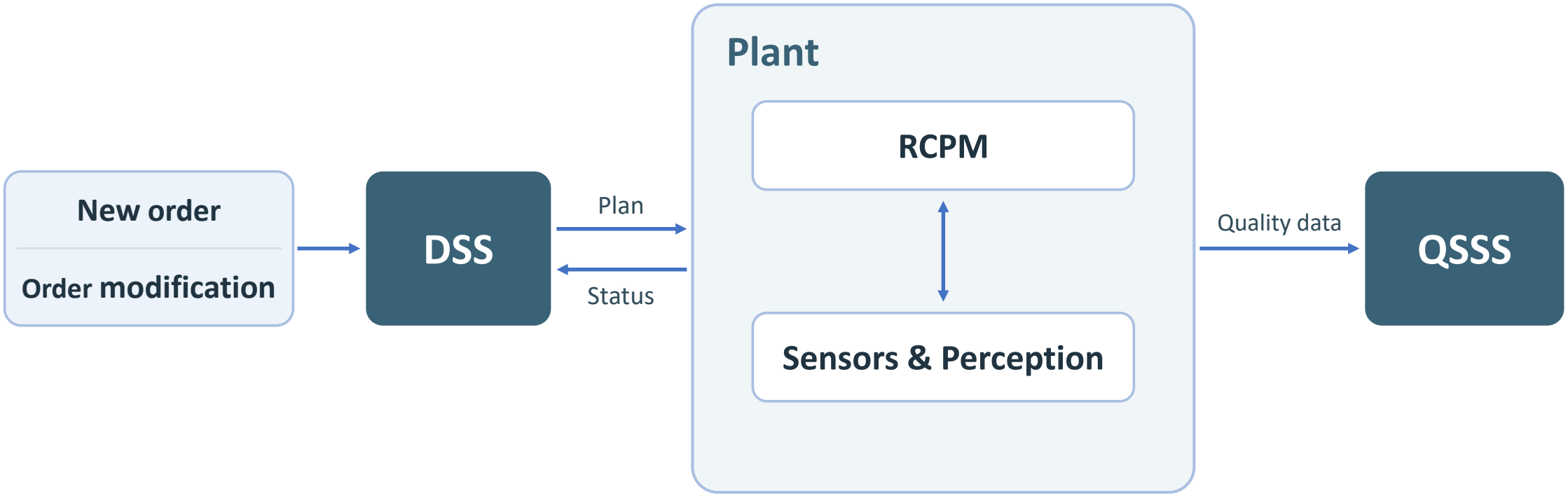
Quality supervision (QSSS)
Check production output

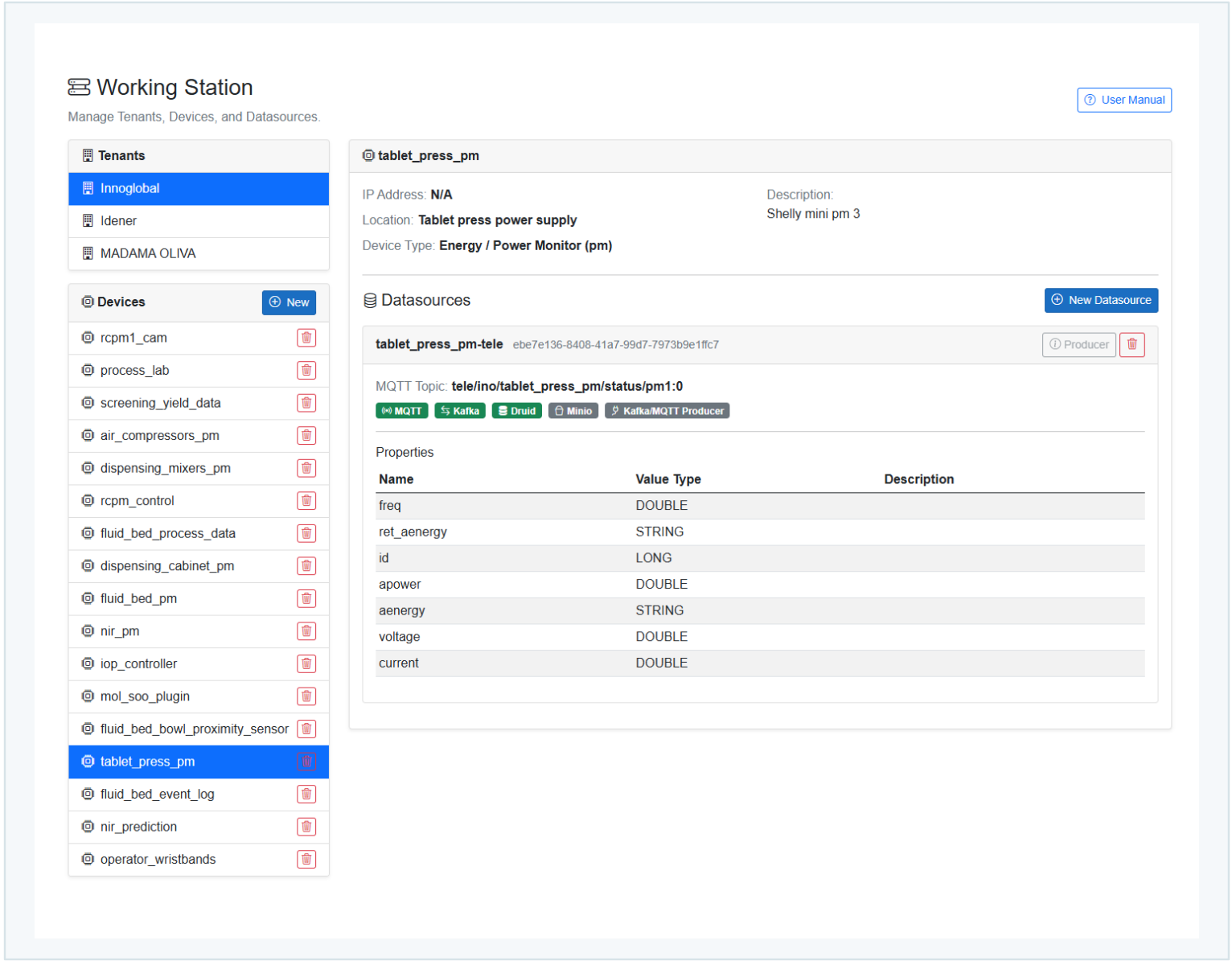
Document management
Manage process records

Eight modules connect through the IOP

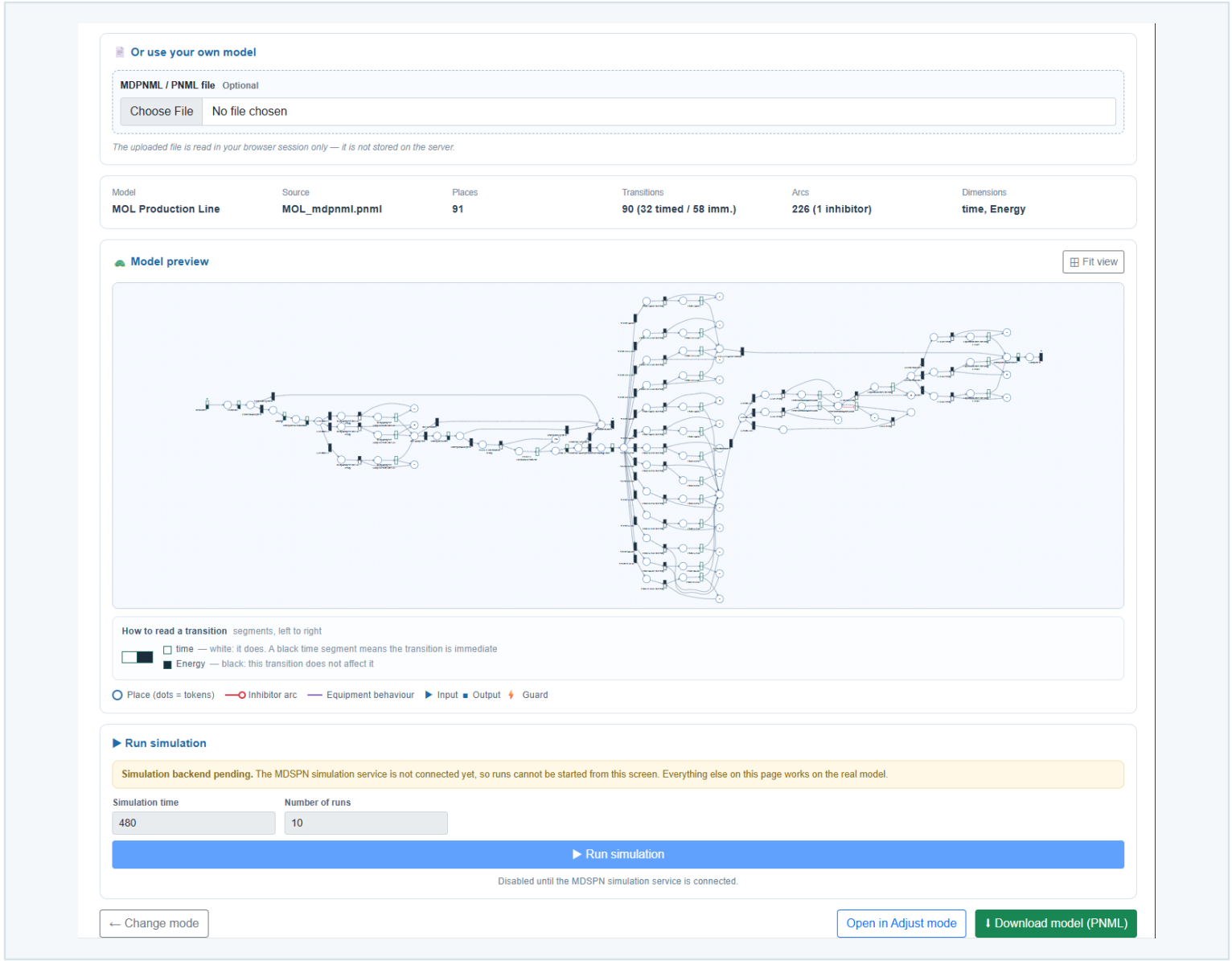


From order updates to quality supervision

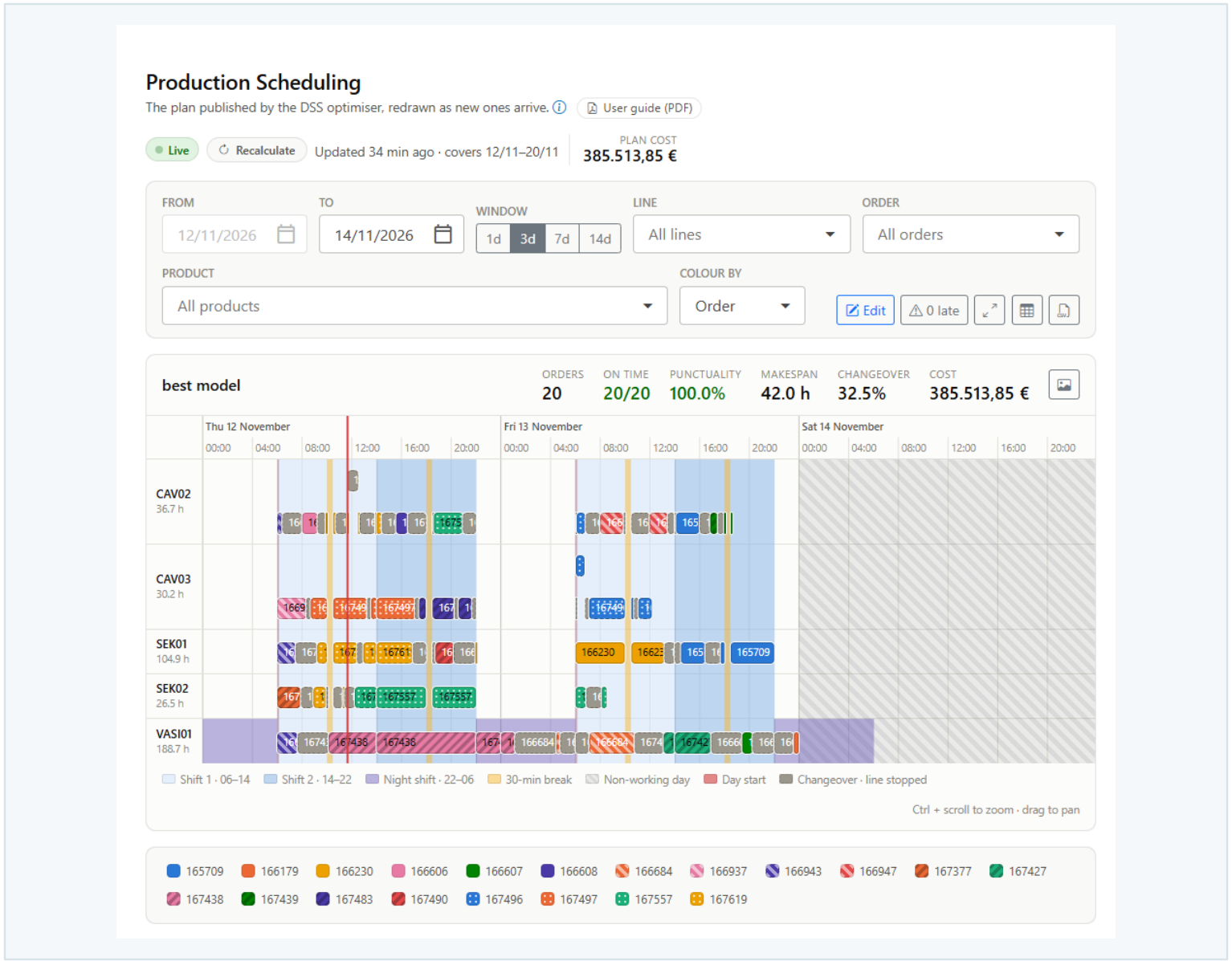




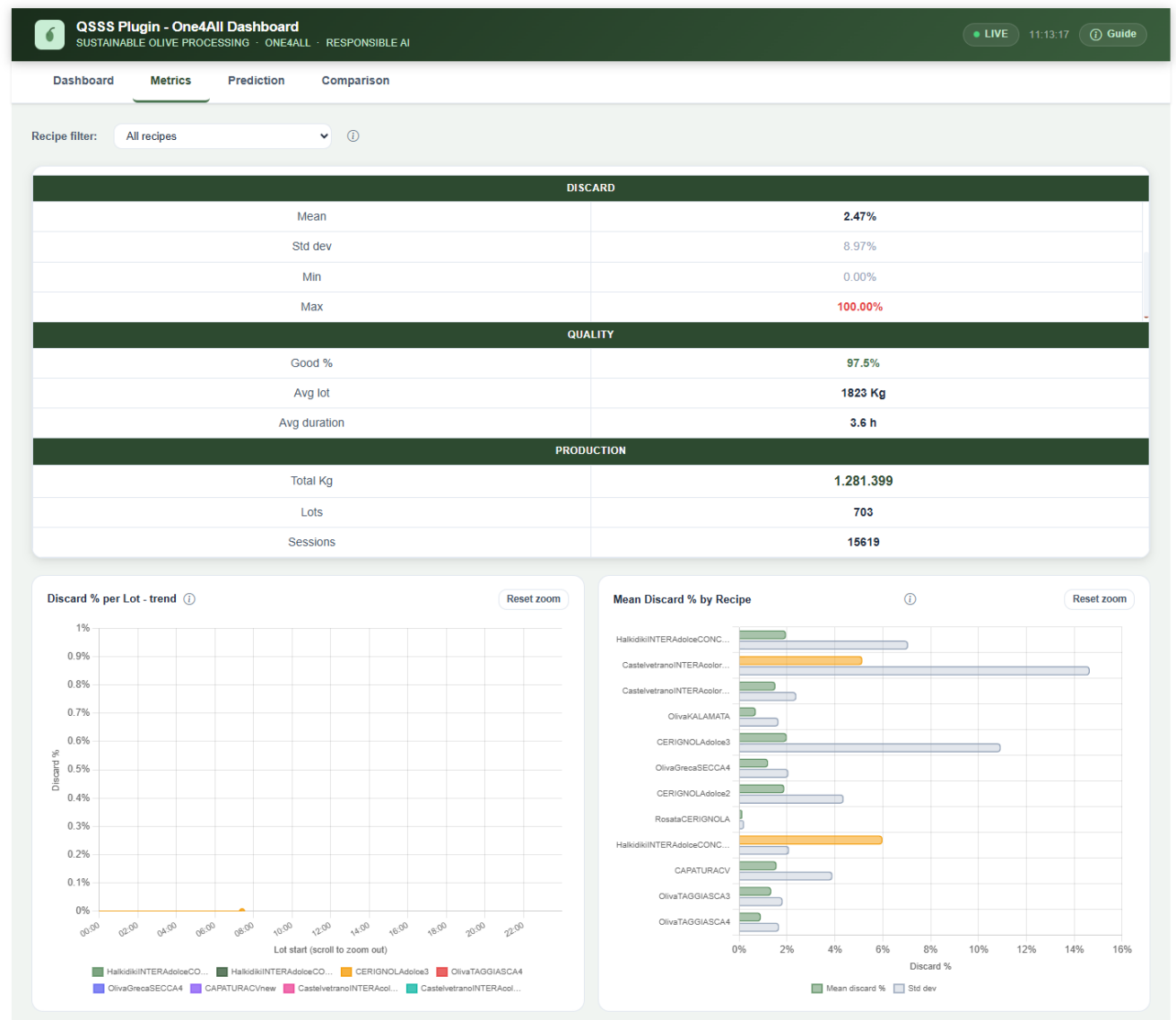
Working Station



Digital Twin

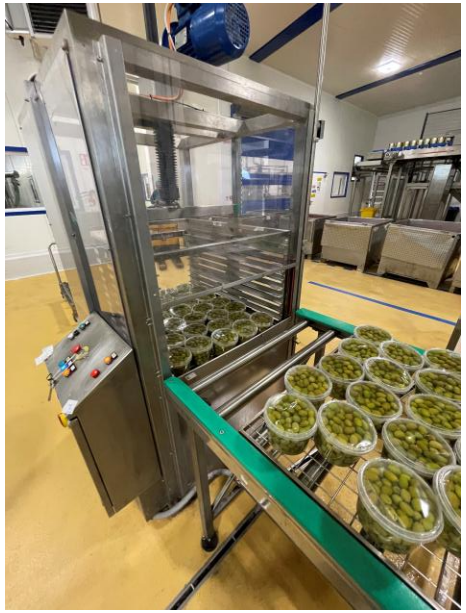


Decision Support System



Quality Statistical Supervision System

Two pilots, one product approach



PILOT 1

Madama Oliva

Food processing

Olive sorting and jar handling at the end of the line.



PILOT 2

INNOGLOBAL

Pharmaceutical process development

Material transfers in oral solid-dose manufacturing.

SHARED APPROACH

The same logic, configured for each process and its equipment.

PILOT 1 | MADAMA OLIVA

Custom AI vision
Checks olives for shape, colour and visible defects.

Robotic handling (RCPM)
Picks and places products. Cameras help locate boxes and check product status.

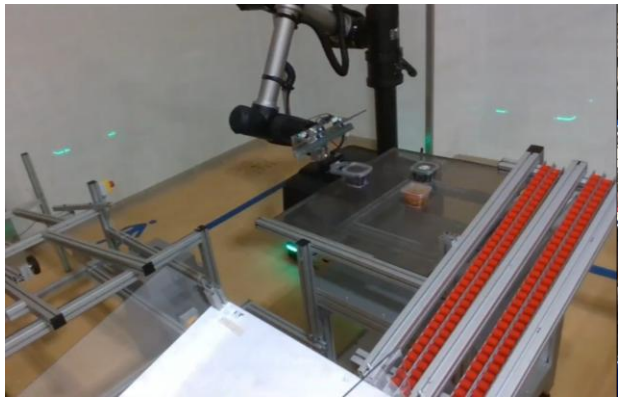
Decision support (DSS)
Helps respond to new orders and changing priorities.

Quality supervision (QSSS)
Reviews olive-sorting results and RCPM quality checks.

> **INTENDED VALUE**
> Flexible vision and handling support repetitive work while retaining product-specific process requirements.



Olives on the sorting line



EOL at the pilot site

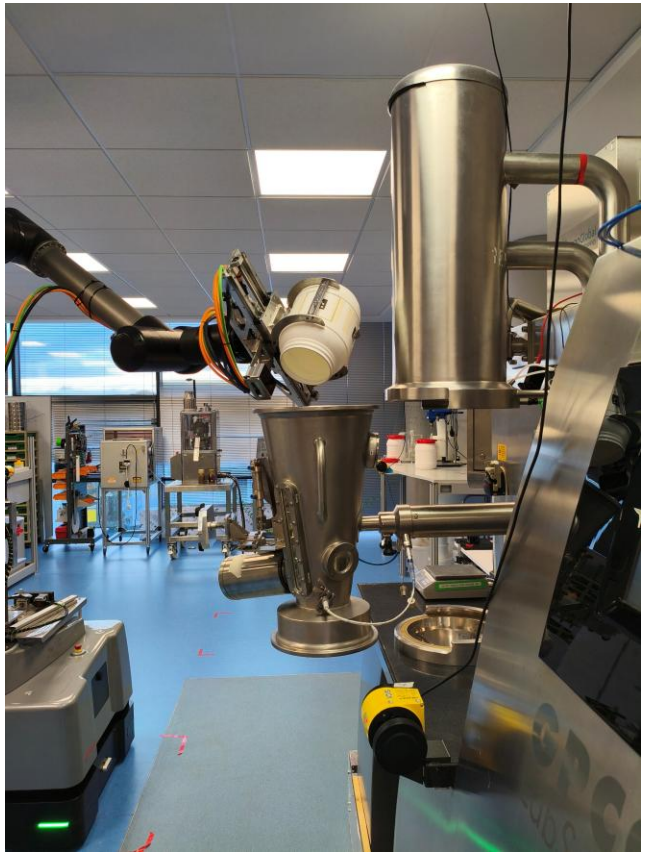
PILOT 2 | INNOGLOBAL

Robotic handling (RCPM)
Moves material containers between blending, granulation and transfer toward tablet pressing.

Decision support (DSS)
Schedules orders and coordinates handling tasks.

Quality supervision (QSSS)
Reviews near-infrared sensor readings after blending to help check blend homogeneity.

> **INTENDED VALUE**
>
> Reduce manual handling and operator exposure.



Prototype RCPM gripper and fluid-bed adapter

What it takes to adapt ONE4ALL to a new line

Reuse the platform

IOP

Connect data, applications and equipment.

Common digital modules

Select the capabilities the line needs.

Reconfigurable equipment

Reuse modules that suit the task.

Configure the line

Device connections

Map the signals from local equipment.

Task sequences

Set the order of work and operator steps.

Quality checks

Define what to check and what counts as a pass.

ONE4ALL Hackathon challenges

The Agile Gripper Dilemma	Reconfigure robotic gripping for different products.
The Multi-Objective Shop Floor	Balance energy use and worker well-being.
The Computer Vision Challenge	Inspect products and trace packages.
The Latency Labyrinth	Keep scheduling and robots in sync when the network slows.

THANK YOU!

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