CONSORTIUM

LMS — Laboratory for Manufacturing Systems & Automation

BIBA

Whirlpool CORPORATION

Casp

SWMS DIGITAL INNOVATIONS

eit Manufacturing

Co-funded by the European Union

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UPMASS

## Unified Predictive Maintenance & Scheduling System

Bridging Predictive Maintenance to Production Planning and Scheduling

www.upmass.eu

Background

Currently maintenance strategies work in two different steps separately. First, detect and predict the machine's health. Second, maintenance planning & scheduling. This leads to higher costs of maintenance, equipment/plant downtime, and time-sensitive.

UPMASS is an EIT-Manufacturing project that aims to provide an open solution by bridging the entire data value chain from predictive maintenance to maintenance planning and scheduling.
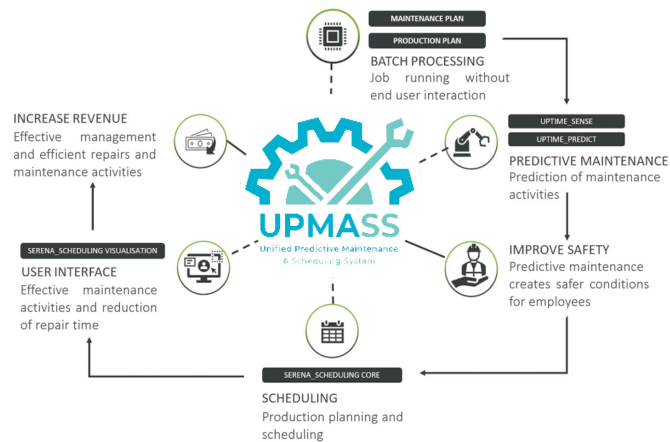
UPMASS targets mainly the manufacturing industry, without any restriction, as well as in additional domains where predictive maintenance (PdM) strategies can be of benefit.

UPMASS will be established in Whirlpool EMEA in Italy. In particular in the in the production of the refrigerator doors. The use case aims to predict the health of the machine(s) involved as well as to identify the proper maintenance timeslot that will not affect or stop the production.

UPMASS Benefits

- Increase Mean time Between Failures (MBTF)
- Increase Overall Equipment Effectiveness (OEE)
- Decrease Mean Time to Repair (MTTR)

UPMASS Platform

UPMASS develops an IIoT edge-to-cloud solution. It builds upon the results of H2020 projects, SERENA and UPTIME, to create an innovative unified predictive maintenance and scheduling product to support manufacturers in their maintenance activities.

The platform integrates the following tools:

- **UPTIME_SENSE**, a local hub for data acquisition

- **UPTIME_DETECT&_PREDICT**, a component for streaming data analytics processing respectively

- **SERENA**, a multi-criteria decision-making framework implemented into a software tool suitable for production planning and scheduling in versatile manufacturing environments.

The UPMASS Platform Conceptual Architecture
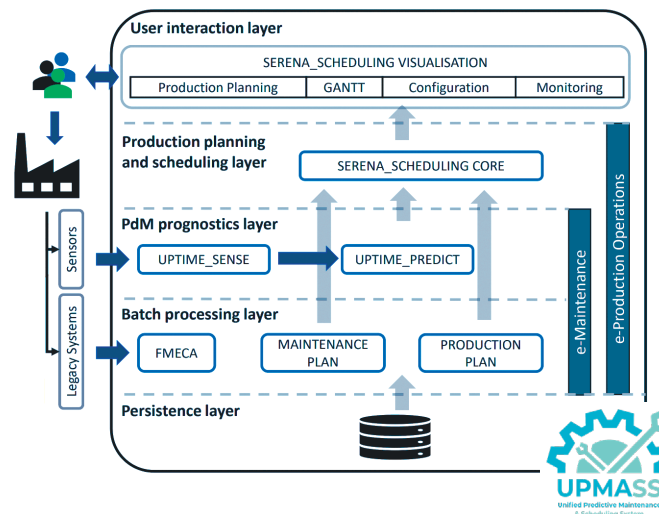
Key Features

UPMASS includes the complete chain from sensors to predictive analytics generation, maintenance activities planning and scheduling along with existing and/or future production operations in the manufacturing workplace.

Predictive Maintenance Diagnosis:

- **SENSE**

  Data aggregation from heterogeneous sources configurable diagnosis capabilities on the edge.

- **DETECT**

  Intelligent diagnosis to provide a reliable interpretation of the machine's health.

- **PREDICT**

  Advance prognostic capabilities, using AI algorithms.

Production planning and scheduling:

- Decison making based on AI methods Dynamic definition of multiple criteria by the user.

IIoT Cloud Platform:

- Definition of Asset's as the Industry4.0 Smart Component the Asset Administration Shell (AAS).

- Data acquisition & manipulation , Connectors for basic industrial protocols, Historical data access.