



# **Design for Predictive Maintenance**

## **A handbook**



smart

advanced manufacturing

## ORGANISATION PROFILE

The University of Gävle targets four **strategic research areas** in our efforts to meet key societal challenges, where one is **Intelligent Industry**. This research area contributes to the efforts of meeting societal challenges regarding long-term sustainable production. Innovation, resource efficiency and good working environments are important parts. This research area mainly targets businesses and organizations in industrial networks and value chains. Our focus lies in **digitalization**, organization design and their interaction in innovation processes, from **the development of technological systems, products and processes to the design of production systems**, business relations and business models.

This project idea is presented within the framework of **digitization** and the research group working on **predictive maintenance**.



# PROPOSAL INTRODUCTION (I)

**Vision:** A handbook (or guidelines) for including predictive maintenance in automation system design

**Motivation:** Predictive maintenance is a hot topic, but not yet mature enough to be generally applied, especially not in a factory with a mix of older and modern equipment. Although most companies collect large amounts of data, there is still work to be done to extract information from all the data. Moreover, tools and skilled personnel to analyze the information are limited.

Much of the information needed can be obtained directly or indirectly from automation systems. These engineers also have algorithm skill as well as knowledge of processes, this should be taken care of when designing predictive maintenance. What needs to be supplemented is access to data from e.g., MES and computerized maintenance management systems (CMMS), a few extra sensors and knowledge from process developers.

During the design phase of a production unit, this competence is gathered, and it is possible to supplement the design with extra software modules to predict maintenance needs. In addition, at these times the group of experts are available throughout the chain from requirements specification to acceptance testing.

Most manufacturing companies have a project handbook that both internal and external designers follow. In general, these handbooks do not include design elements for predictive maintenance. The proposed project is motivated by filling this gap.

**Content:** Needs inventory, standardized modules for predictive maintenance, interoperability, design guidelines, and use case.

## PROPOSAL INTRODUCTION (II)

**Expected outcome:** A handbook for including predictive maintenance in automation system design

**Impacts:**

- Increased availability in production
- Increased sustainability. Maintenance is counted as one of the innermost circles in the circular economy.
- More efficient maintenance. Uniform design brings common knowledge for maintenance personnel, which leads to redundancy and efficiency.
- Data ownership. The alternative to own handbook is to buy the (product or service) supplier's solution. Which can mean less control over data and methods.

**Schedule:** The duration of the project is three year. Preliminary start date is Jan 1, 2024, and end date is Dec 31, 2026.

## PARTNERS

**Current Consortium:** There are no partners yet

**Partner search:**

- Automation engineers for industry
- Experts in maintenance
- Competence in industrial IT with connection to OT
- Manufacturing companies with an interest in the handbook



## CONTACT INFO

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