

# FM4017 Project

**Title:** Cloud-based Data Logging and Management System for Next Generation Smart Factory and Industry 4.0 Solutions

**USN supervisor:** Hans-Petter Halvorsen

**External partner:** USN Porsgrunn and local industry (subcontractors and vendors).

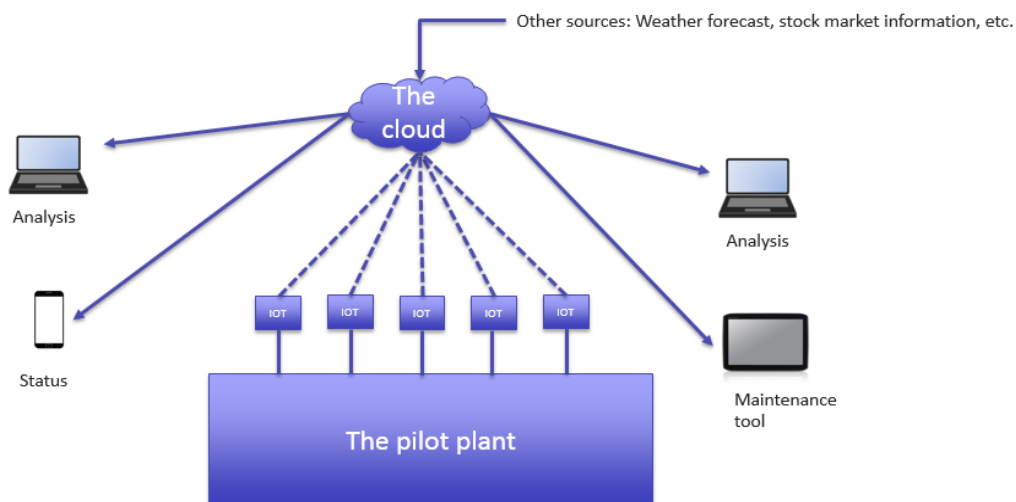
## Task background:

The “Smart Plant” or “Smart Factory” concept is a current trend in automation technology, mainly in manufacturing. The concept includes cyber-physical systems, Internet of things (IoT) and cloud computing. Autonomous systems, digital twins, augmented reality, machine learning and big data are also related topics. USN is about to send an application to The Research Council of Norway, asking for support for research in the area “Autonomous systems – transport and process industry”. A construction of a pilot plant fits very well with this application, and gives valuable insight in the “smart factory” concept when commissioned. It is expected that local industry will be interested in supporting the construction of the plant and learn from the insight gained over time.

## Task description:

The “Smart Plant” or “Smart Factory” concept for the process industry involves creating autonomous systems for predictive maintenance and monitoring/optimization of energy consumption. To achieve this, process data must be acquired and stored in a cloud database and made available for analysis. A pilot plant, built in the process hall at USN Porsgrunn for demonstrating this concept, can be a useful mean to establish collaboration between USN Porsgrunn and local industry (including subcontractors and vendors).

The Figure below shows a simple sketch of the planned system:



The main part of this project is to develop a cloud-based data logging and management system for the next generation Smart Factory and Industry 4.0 solutions.

The system should be able to configure and manage information about the data, log data, store the data in the cloud, monitor and trend the data.

Relevant topics will be Data Logging and Monitoring, Database Systems, Web Technology, REST APIs, Internet of Things (IoT), Industrial Internet of Things (IIoT), Industrial IT, Control Systems, Cloud Computing and Storage, etc.

Security issues are also important aspects for such a system.

The first step is to apply the systems to a pilot plant which will be developed at USN Porsgrunn in collaboration with local industry.

The pilot and the system which should be developed will be important part of the research at USN-TNM.

**Student category:**

IIA

**Practical arrangements:**

**Signatures:**

Supervisor (date and signature):

Students (date and signature):