Propulsion Analytics

ADQM

Vessel & Fleet
Data Quality Management

ADQM

Automatic **D**ata **Q**uality **M**anagement

The Vessel Data Problem

In modern vessels, 1000s of signals are collected onboard, transferred ashore or to the cloud and stored.
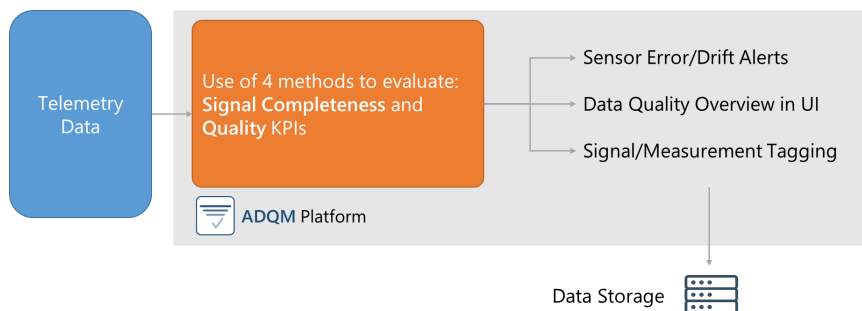
Sensor errors and drift can reduce the quality of stored data, resulting in:

- Reduction of high quality data availability

- Increase in time/cost for data analysis

- Increase in data storage costs for unusable data

The ADQM Solution

We take all telemetry data and use four methods to evaluate:
- **Signal Completeness**
- **Signal Quality**

Telemetry Data

Use of 4 methods to evaluate: **Signal Completeness** and **Quality** KPIs

ADQM Platform

Sensor Error/Drift Alerts

Data Quality Overview in UI

Signal/Measurement Tagging

Data Storage

The ADQM platform:
- Generates alerts for sensors or signals that have issues, so that they are checked immediately.
- Provides a data quality overview for each system, vessel or the whole fleet using a purpose-built UI.
- Tags measurements so that in later data postprocessing, periods with inferior data quality or completeness can be omitted without further data analysis steps.

Propulsion Analytics

Our 4 Methods for Data Evaluation

1 Initial
At first we use simple min/max limits for each signal, and check the data completeness.

3 Statistical
Here, each signal is checked for long-term deviations (sensor drift or bias) compared to its historical values.

2 Engineering (rulesets)
Then we use physical rulesets which dictate the relationship between signals. For instance in the pressure measured in a pipe with fuel flow, the pressure upstream should always be higher than downstream. If not there is an indication of a problem, and the reported KPI drops.

4 Machine Learning
Finally, machine learning is used for simultaneous data validation of multiple parameters (outlier detection) and for data prediction and fill-in (Data imputation).

ADQM

✓ **Immediate identification and alerting of sensor errors**

✓ **Simple overview of fleet data quality**

✓ **Evaluation and tagging of data quality for further use**

ADQM enables each shipping company to improve data quality and reduce data evaluation time and effort.