

Using IoT in Predictive Maintenance

Charting the Course for Sustainability - Baltic Sea region as a front-runner in clean shipping and shipbuilding

21 September 2021

Sverre Patursson Vange

J. Lauritzen

J. Lauritzen A/S - overview

▶ J. Lauritzen

- Established 1884
- Experience with Reefer- Tank-, Cruise-, Offshore-, Polar vessels. Yard owner 1937-88
- Today: 150 Employees onshore, 100% foundation-owned



▶ Lauritzen Bulkers

- Mostly Time Chartered vessels: Handysize and a few Supramax
- Technical Management of 3 owned vessels outsourced
- Operates 85 bulkers from Copenhagen, Singapore and Stamford USA



▶ Lauritzen Kosan (+ Epic Gas = BW Epic Kosan)

- Ship-owner
 - Own vessels, Joint ventures, Bare Boat and Time Charter, Pool Partners
- Technical Management of 25 LPG carriers from Copenhagen (+ 42 from Singapore)
- Operates 37 LPG carriers from Copenhagen (+ 44 from Singapore)



Use Data to discover Engine problems

- ▶ Engine breakdowns at sea are (very) expensive both cost- and CO₂-wise
- ▶ Existing Onboard systems are typically
 - Already connected to a lot of onboard sensors, even on older ships
 - Only setup to catch extreme temperatures/pressures/etc. (e.g., broken thresholds)
 - Not analyzing trends or cross-checking data (e.g., comparing different cylinders)
- ▶ Auto logged data from Existing Onboard systems
 - Studies shows that “unexpected” Engine events typically have been precedent by anomalies in data
 - Sometimes “early warnings” has been seen to start developing days before the final critical event

Extended use of the setup from ECOPRODIGI

▶ ECOPRODIGI

- Auxiliary Engines on 3 vessels: 4 Stroke MAN 7L 16/24
- Data logged through Lynsø/Wärtsilä alarm system

▶ EXOPRODIGI

- Main Engine on 6 vessels: 4 Stroke MAN 8L 27/38
- Data logged through NORIS alarm system

▶ Cloud setup needed update due to increased amounts of data

- Storage and processing
- Visualization

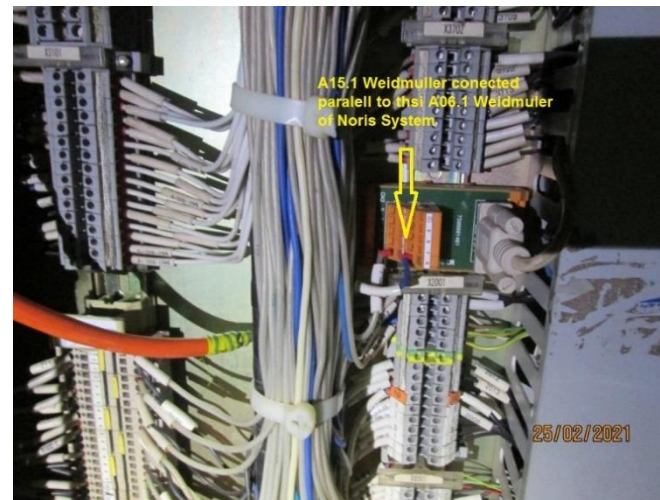
Challenges

- ▶ Lots of data needed. The more the better.
 - Engine states from newly-overhauled to just-before-dry-dock
 - Operations in "all" climate conditions
 - From hot and humid in the tropics to cold and dry in the arctic
 - From calm sea to storm

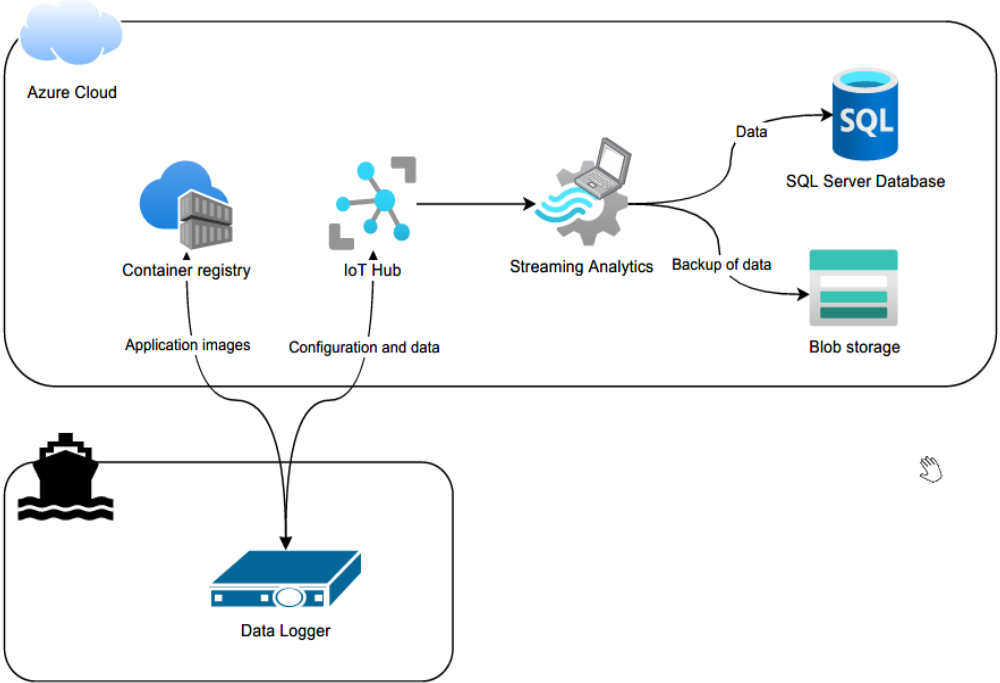


More Challenges...

- ▶ Covid-19 made technician attendance impossible for all but one vessel
 - Manual/Guideline created onboard during pilot installation
 - Remaining installations had to be done by onboard crew



Improved Data processing and storage

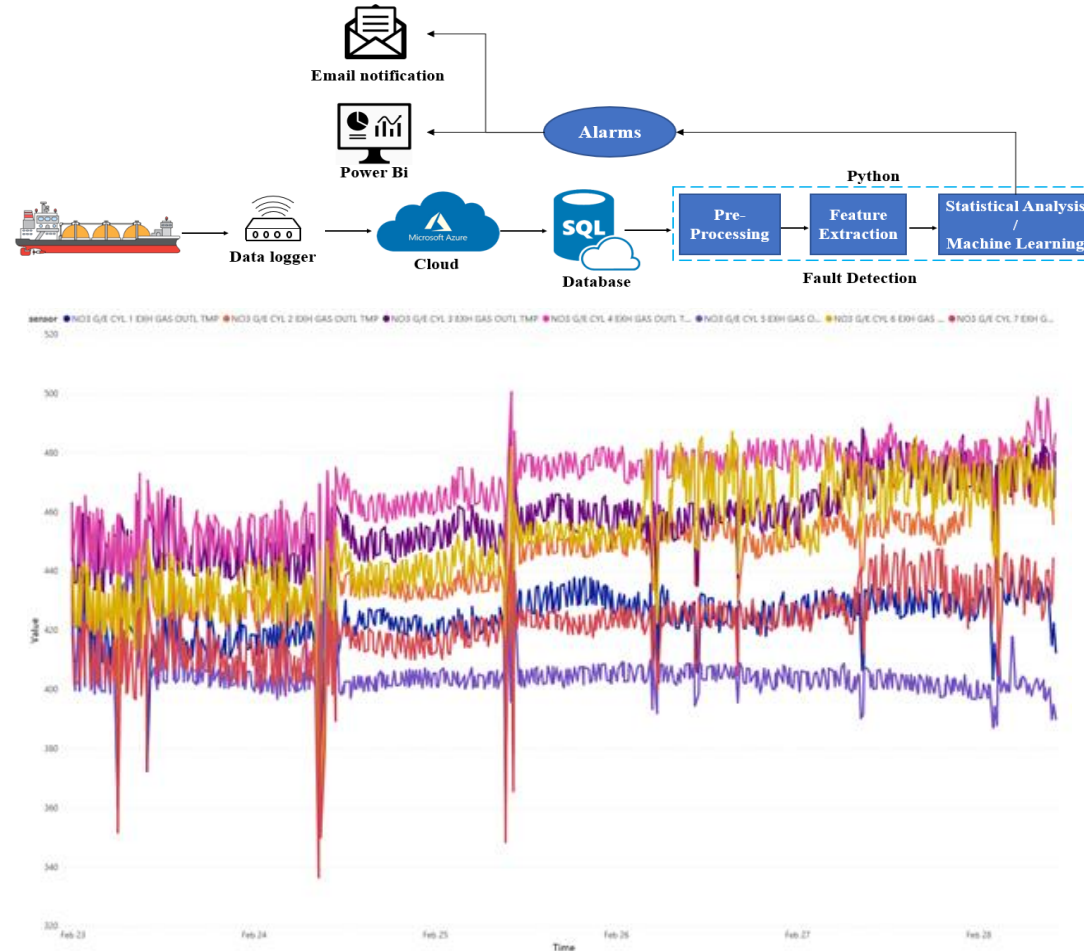


Better tool for fast visualization



Example

- ▶ Leonora Kosan
- ▶ Auxiliary Engine 3
- ▶ No thresholds broken
- ▶ Difference in Exhaust Gas Temperatures between cylinder 4 and 5 exceeding 100 °C.
- ▶ General trend of increasing deviation between cylinder temperatures
- ▶ Vessel Manager notified and troubleshooting with CE initiated



Thank you!

Sverre Patursson Vange



J. LAURITZEN

spv@j-l.com

EXOPRODIGI lead partner:

University of Turku

Ms. Elisa Aro, Research Manager

elisa.aro@utu.fi | tel: +358 50 505 8741

