



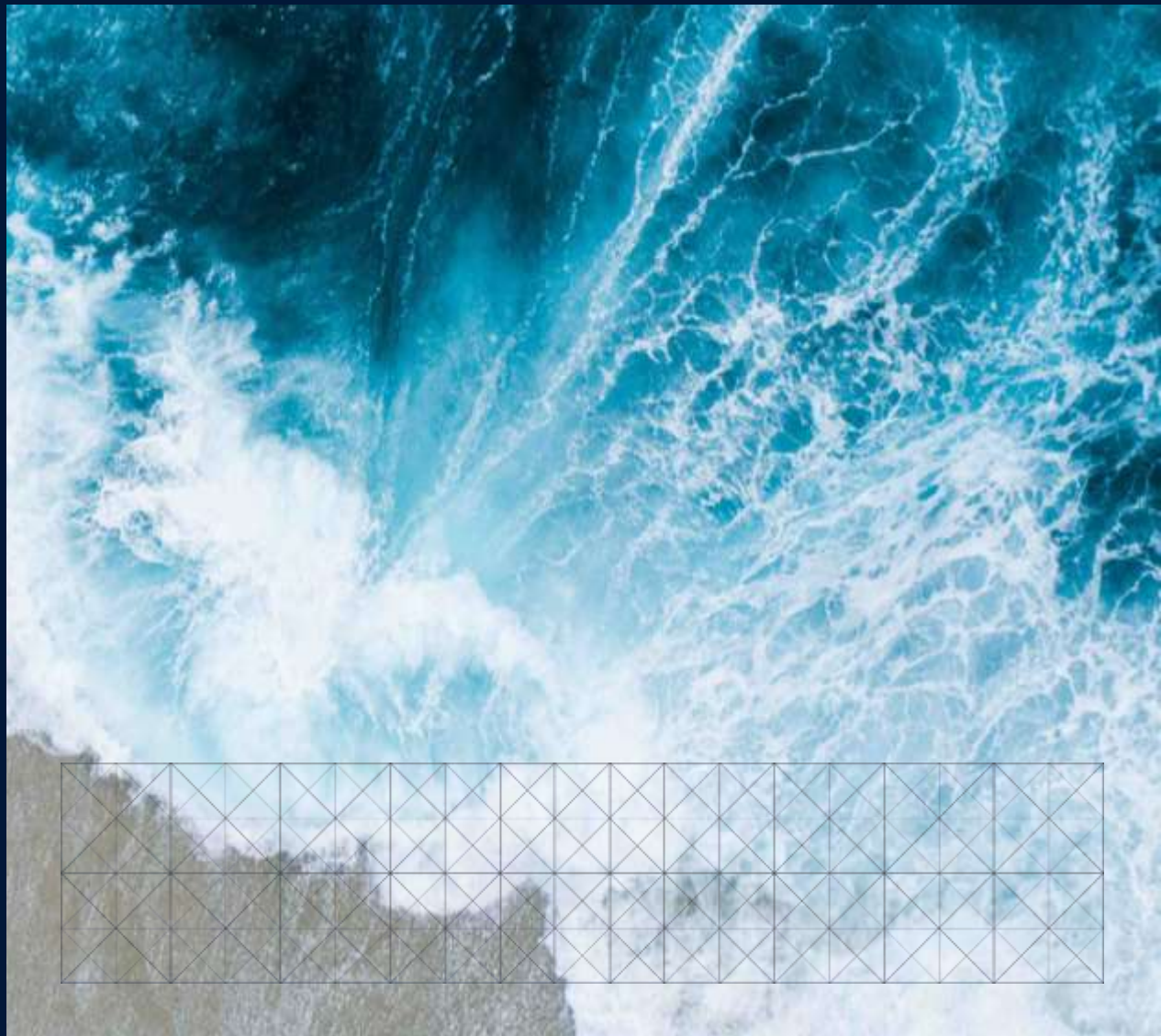
KONGSBERG

AVANSERT MANØVRERING

Veien videre

28/3-2019

Roger Trinterud, Senior Sales Manager



KONGSBERG MARITIME

58 offices in
20 countries
3800 employees
Installed base more
than 18,500 vessels

- Oil & Gas
- Merchant Marine
- Marine Robotics
- Fishery
- Advanced Specialized Vessels
- Global Customer Support
- Services



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Slide

YARA Birkeland

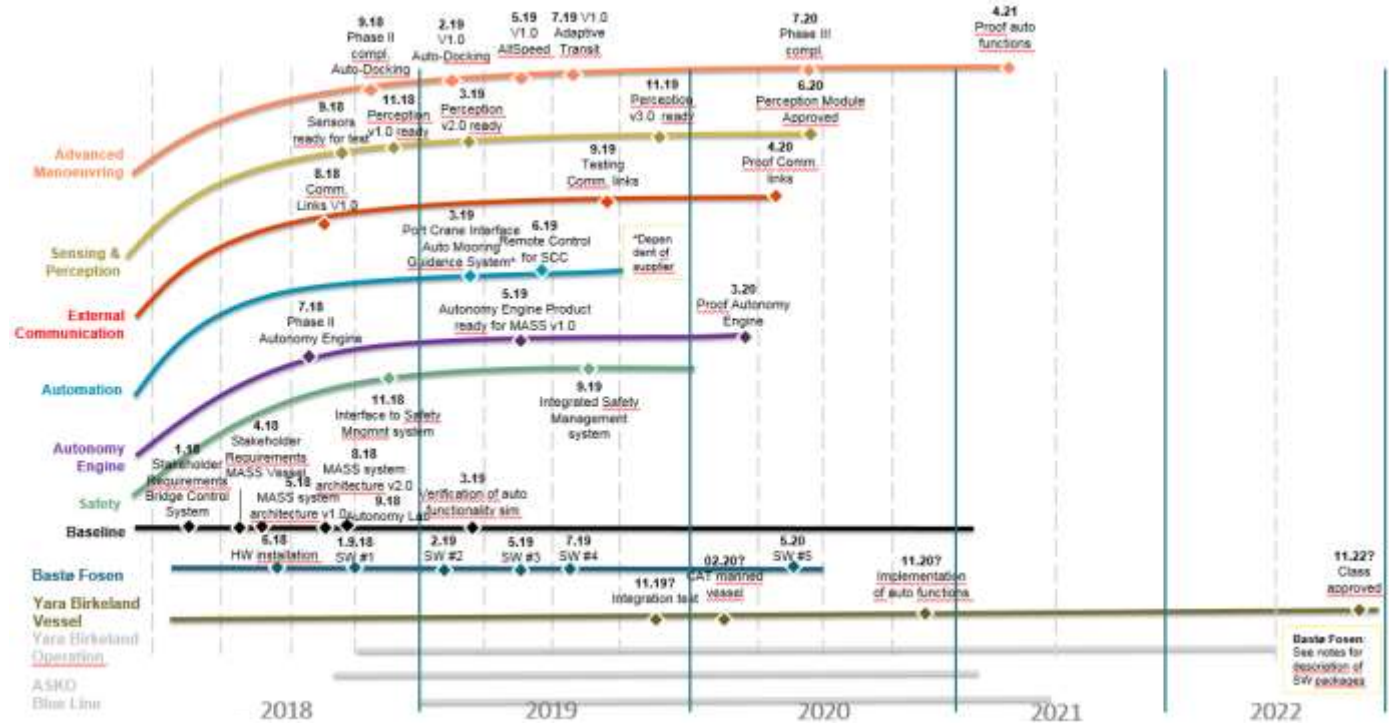
Autonomi vs Automatisering

Sikkerhet

Situasjonsforståelse

Operatørstøtte

Effektivitet

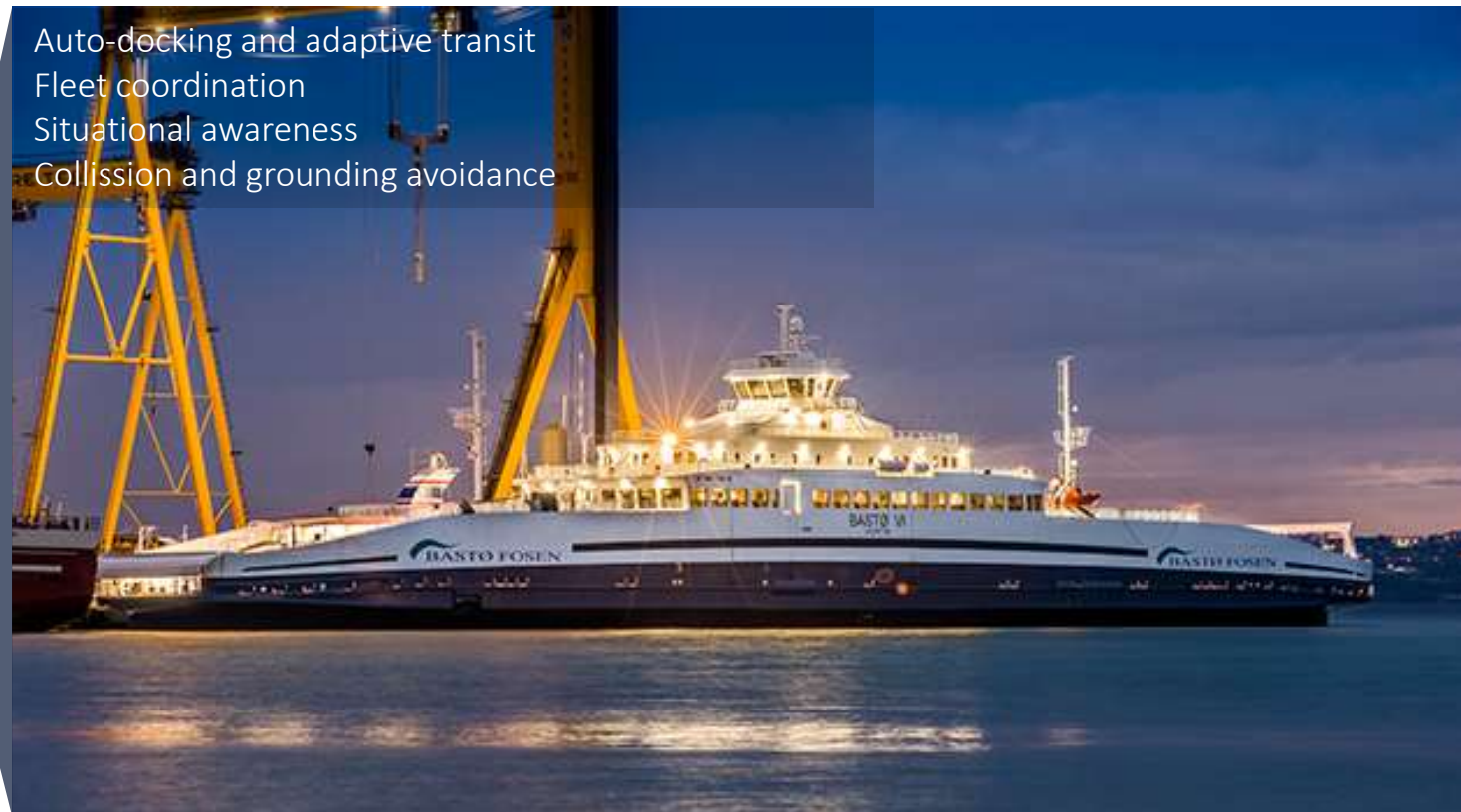


Automatic bridge – Operator assistance

Definisjoner : Norsk Forum for Autonome Skip - NFAS

Operational autonomy levels	Manning levels		
	Manned bridge	Unmanned bridge – crew on board	Unmanned bridge – no crew on board
Decision support	Direct control No autonomy	Remote control	Remote control
Automatic	Automatic bridge	Automatic ship	Automatic ship
Constrained autonomous	-	Constrained autonomous	Constrained autonomous
Fully autonomous	-	-	Fully autonomous

Auto-docking and adaptive transit
Fleet coordination
Situational awareness
Collision and grounding avoidance

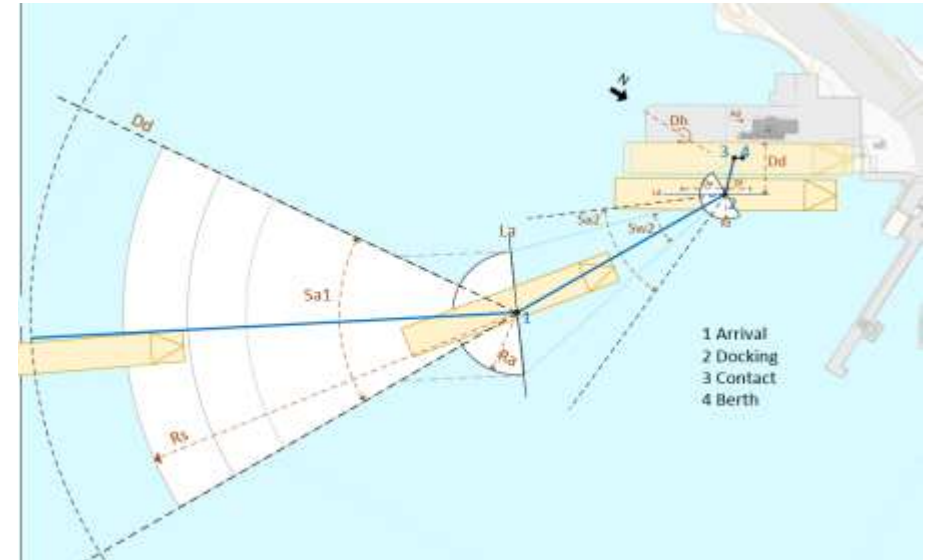
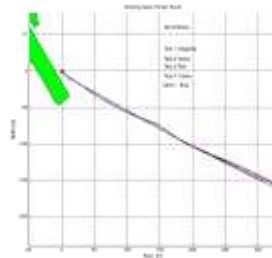
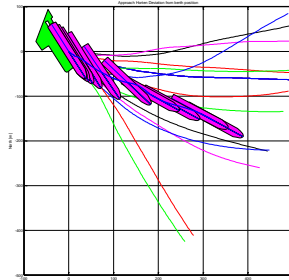


Bilde: med tillatelse fra Bastø Fosen

Automatic Docking

Den kritiske operasjonen

- Sikkerhet
- Forutsigbarhet
- Effektivitet



	Test 1		Test 2		Test 3		Test 4		Demo	
	Mode Transition (hh:mm:ss)	Delta Time (mm:ss)	Mode Transition (hh:mm:ss)	Delta Time (mm:ss)	Mode Transition (hh:mm:ss)	Delta Time (mm:ss)	Mode Transition (hh:mm:ss)	Delta Time (mm:ss)	Mode Transition (hh:mm:ss)	Delta Time (mm:ss)
0	08:19:56		08:38:55		09:00:49		09:18:56		10:13:30	
1	08:22:49	02:53	08:41:50	02:55	09:02:44	01:55	09:21:28	02:32	10:16:17	02:47
2	08:26:27	03:38	08:45:34	03:44	09:06:21	03:37	09:25:11	03:43	10:19:54	03:37
3	08:27:53	01:26	08:47:00	01:26	09:07:46	01:25	09:26:37	01:26	10:21:19	01:25
4	08:28:32	00:39	08:47:41	00:41	09:08:26	00:40	09:27:17	00:40	10:21:59	00:40
		05:43		05:51		05:42		05:49		05:42



2

Fire
smc
Apen

Brukerstøtte

Operatørens tillit til systemene



- ECDIS – Autopilot - Joystick
- Kjente operatørgrensesnitt
- Kjente operatørenheter
- Grafisk presentasjon av planlagt og virkelig oppførsel
- Unngå «dette kunne jeg gjort bedre selv»



Kommunikasjon med kaien

Standardisering av grensesnitt



Bilde fra AN.no (Avisa Nordland)

- Kommunikasjon mellom ferge og utstyr på kai
- Radiolink?
- Kommunikasjon gjennom ladeplugg?
- Kjørebrom, bom og trafikklys
- Fall-lem og
- Lading og fortøyning

Digitalization

Understanding the assets, smart instrumentation



Condition Monitoring Mimics (Online Vibration, ME & AE Diagnostics)



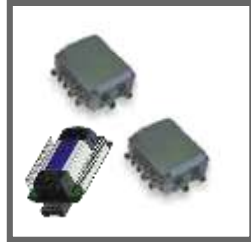
BEARING TEMPERATURE MONITORING



BEARING WEAR / WIO MONITORING



VIBRATION, SPEED REFERENCE AND ELECTRICAL MEASUREMENT TRANSFORMER



DISTRIBUTED & HIGH SPEED I/O MODULES



STANDARD SENSORS FOR ENGINE (EXHAUST GAS, CYLINDER LINER)



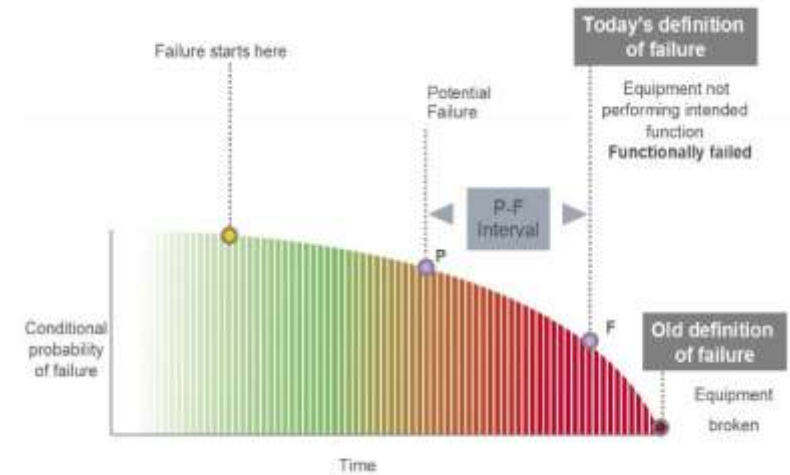
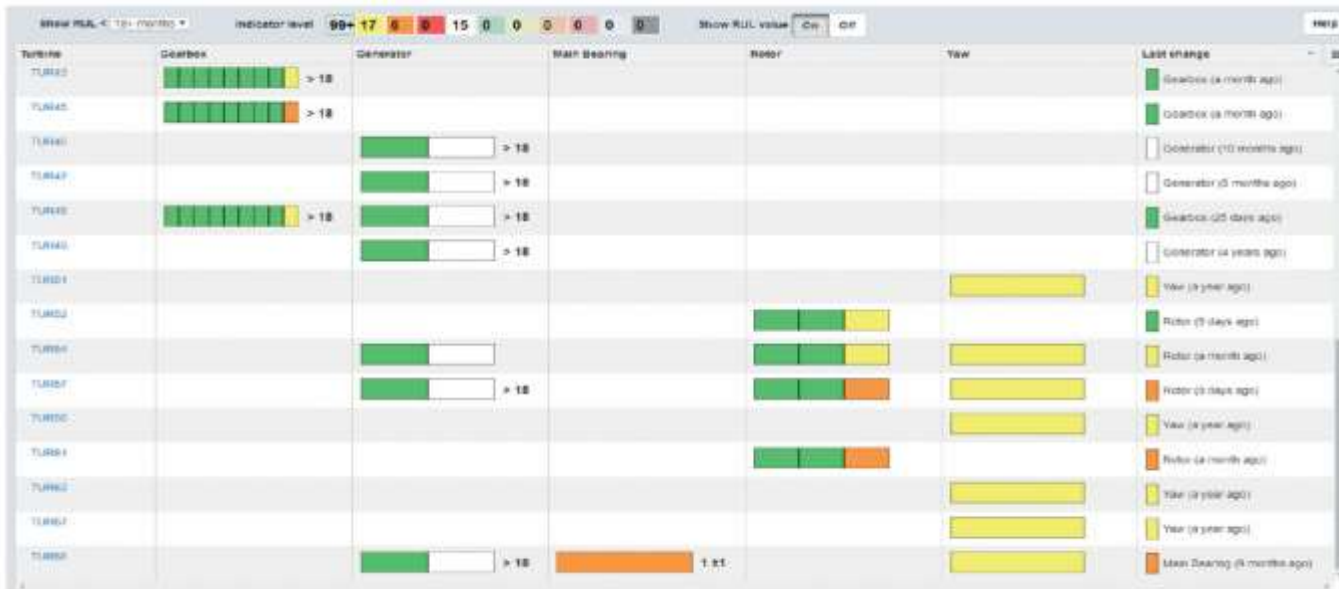
PRESSURE TRANSMITTERS & CYLINDER PRESSURE SENSORS



SHAFT POWER MONITORING

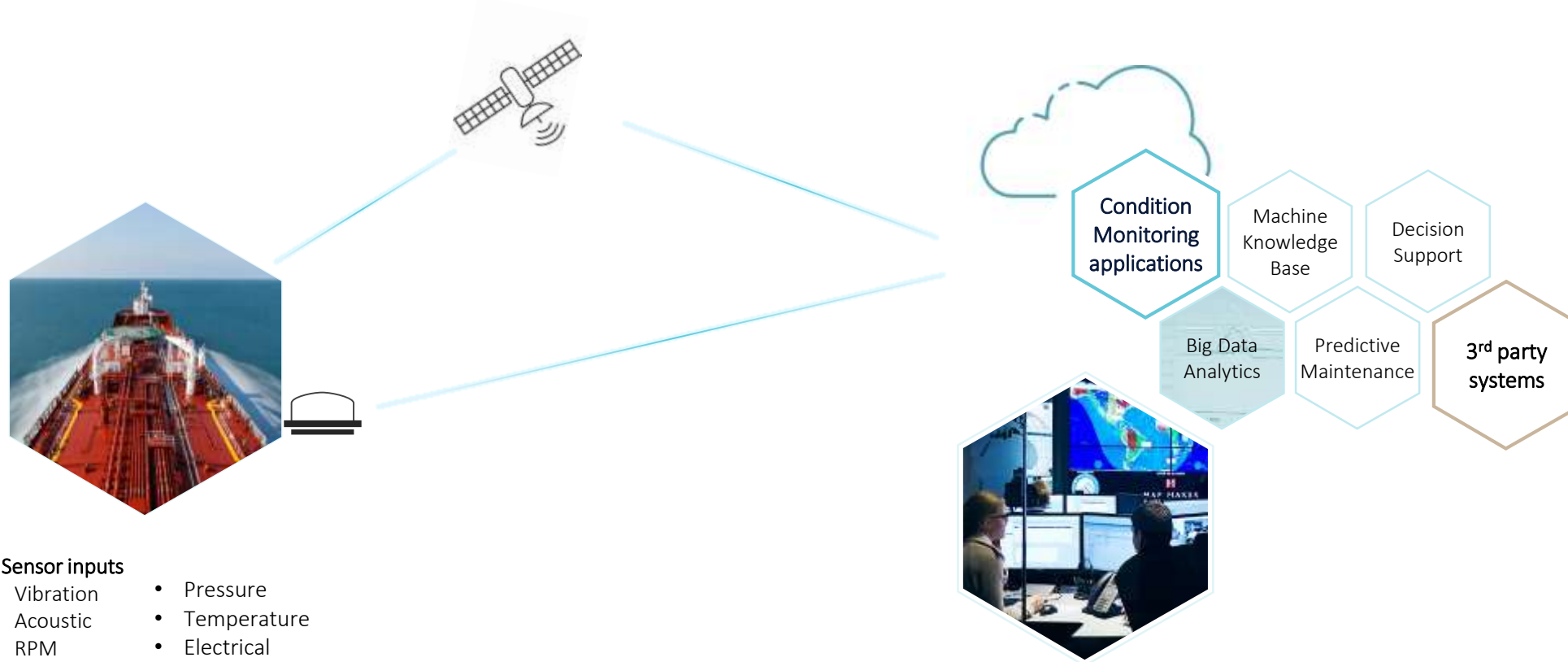
Visualize

Decision support



A holistic, integrated analysis solution

Digitalization - Secure, remote access to data

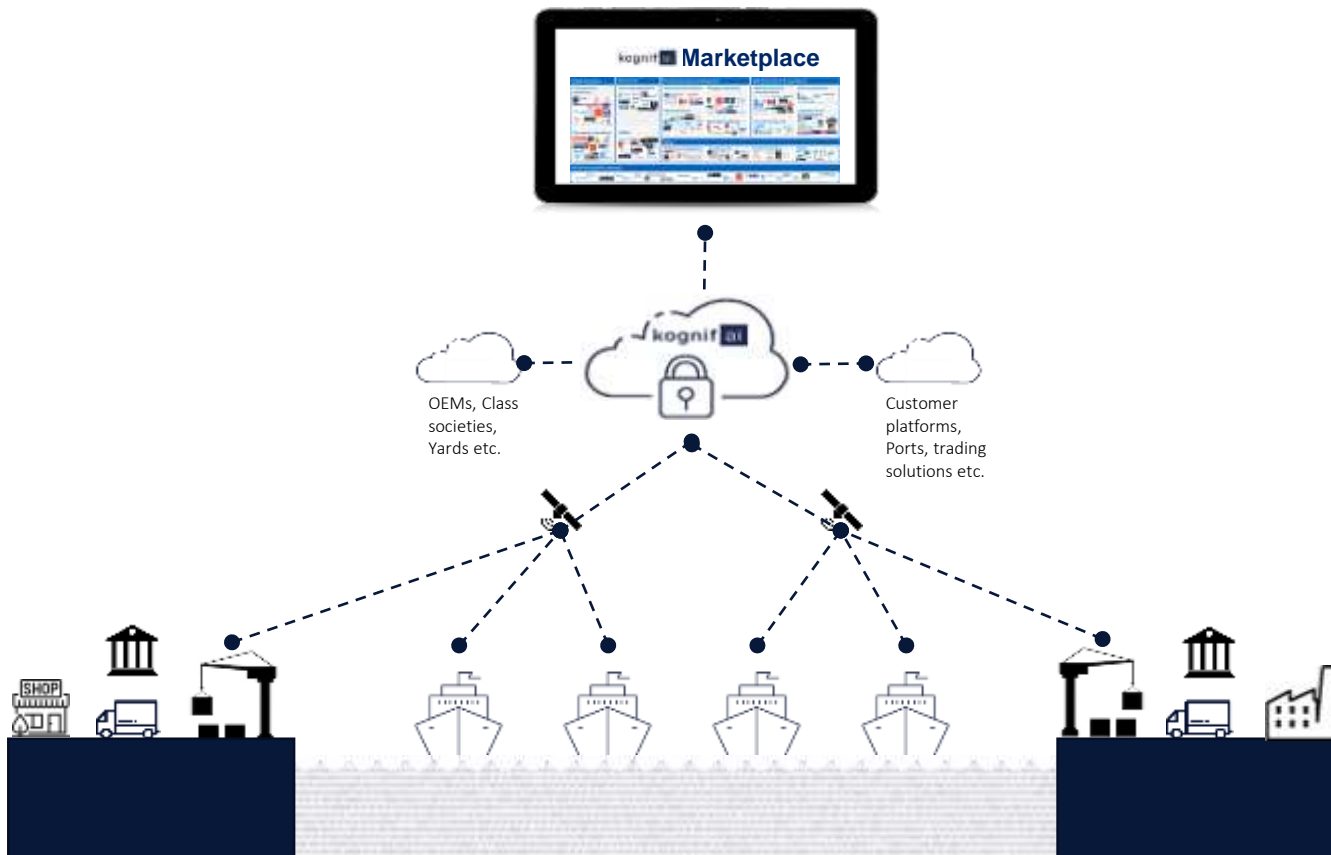


Kongsberg on-shore services
Expert support and reporting services

Communication & Cyber Security

An open and collaborative ecosystem across the entire value chain

Kognifai Maritime Ecosystem



1

ACCESS TO QUALITY DATA

Enable customers to capture and aggregate quality data from their asset in a cost-efficient way

2

BUILD IN CYBER SECURITY

State-of-the-art technology ensures the highest level of security in both data transfer and storage

3

ACCESS TO A BROAD RANGE OF SOLUTIONS

Enable customers to get access to leading applications and domain knowledge to improve operations

4

OPEN AND COLLABORATIVE

Open standards for easy collaboration and at the same time strict data governance and full data ownership



KONGSBERG

Takk for meg

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