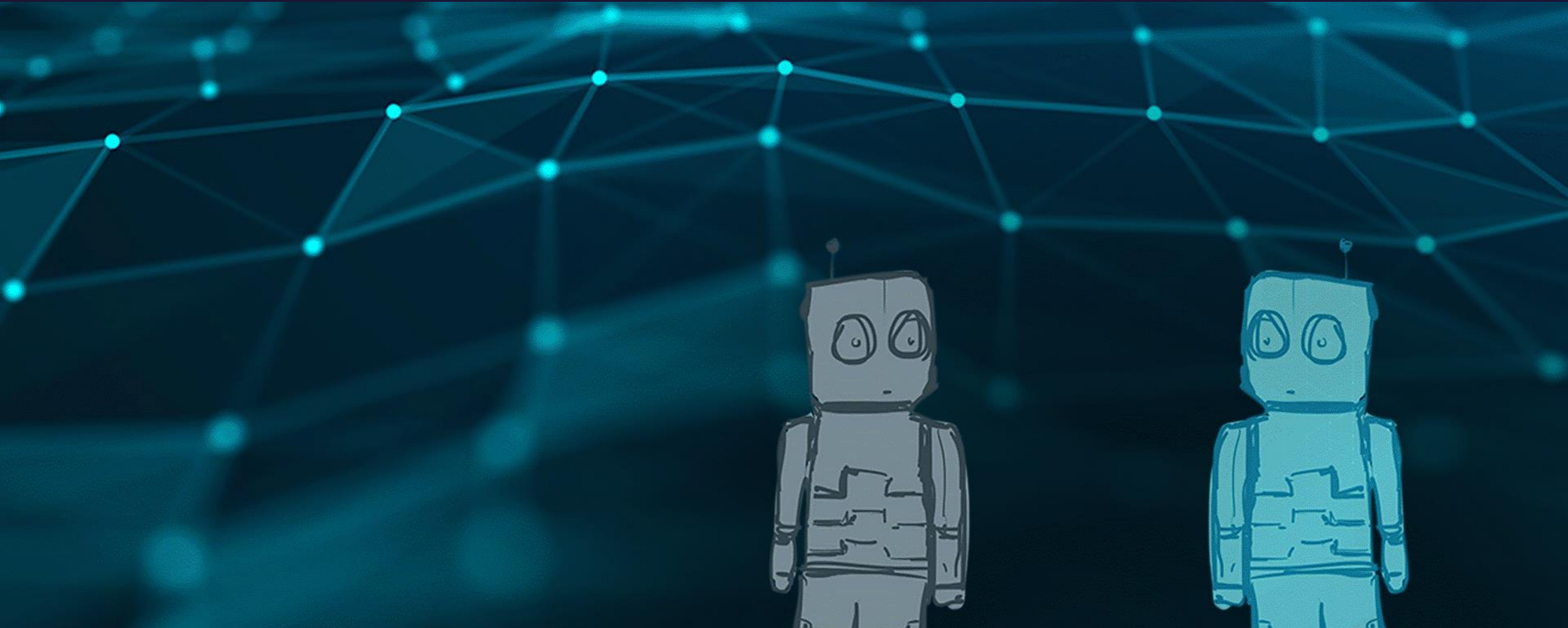# Siemens Energy Marine

Digital Solutions & Services

Impulsvortrag Bremer Schifffahrtskongress 2020

Digitalization: What is in for the Marine Industry ?

Tranzparency

I have no overview of the status of my fleet

EcoMAIN Suite

Challenge – Immense amounts of data available, but mostly unused

Solution – Data capturing from different onboard systems in one common database and central point of visualization

Benefits – Transparency of the status onboard. Comparable information over different systems. Fleet management optimization onshore.

Applications

What should I do with all these information

Applications

Challenge – Make use out of data and generated benefits by solving issues

Solution – AI data model to optimizing plant operation, to improve the efficiency of an asset or create predictive maintenance solutions.

Benefits – Combining the domain knowledge with data analytic technologies generates tangible benefits.

Ecosystem

There are a lot of vendors for digitalization in the market. This increase complexity

Open Ecosystem

Challenge – Different vendors with solutions

Solution – A open Ecosystem, collecting data vendor independent, application from different vendor could run on one platform

Benefits – Integration and coexisting of different solutions like the iPhone principle. Less complexity.
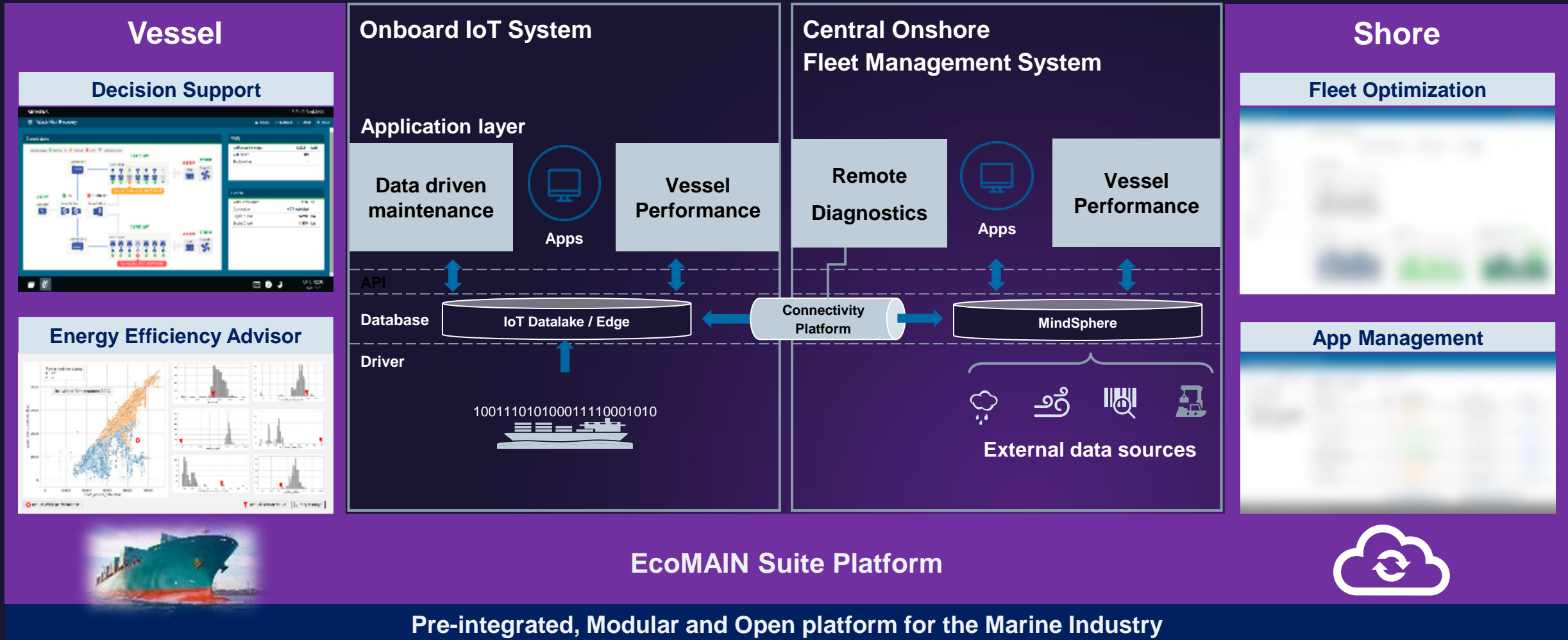
SISHIP EcoMAIN Suite

Cool, and is there
a solution ?

SISHIP EcoMAIN Suite
Digital System for the Marine
Industry

SISHIP EcoMAIN Suite
Digital System for the Marine Industry

Vessel

Decision Support

Energy Efficiency Advisor

Onboard IoT System

Application layer

Data driven maintenance	Apps	Vessel Performance

API

Database   **IoT Datalake / Edge**

Driver

100111010100011110001010

Central Onshore Fleet Management System

Remote Diagnostics	Apps	Vessel Performance

Connectivity Platform

MindSphere

External data sources

Shore

Fleet Optimization

App Management

EcoMAIN Suite Platform

Pre-integrated, Modular and Open platform for the Marine Industry

Environment, digitalization could help

Fuel
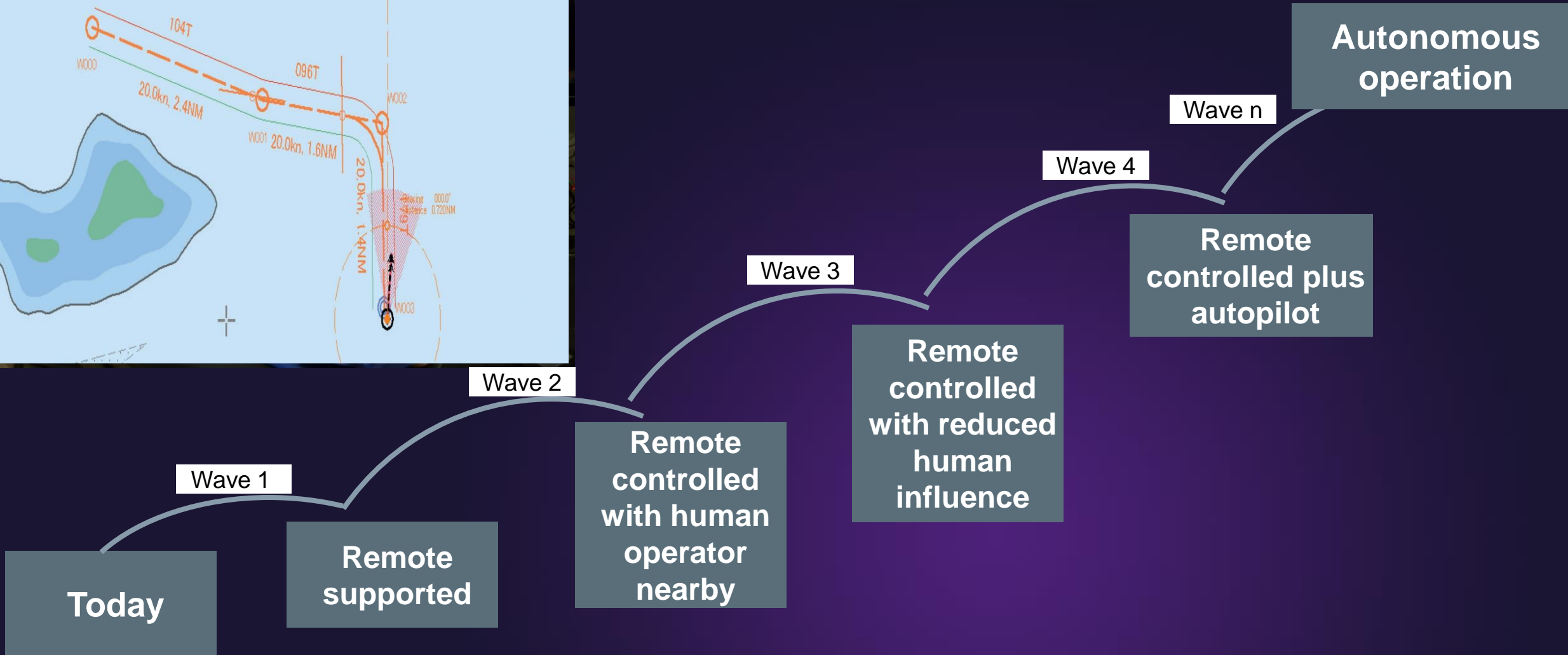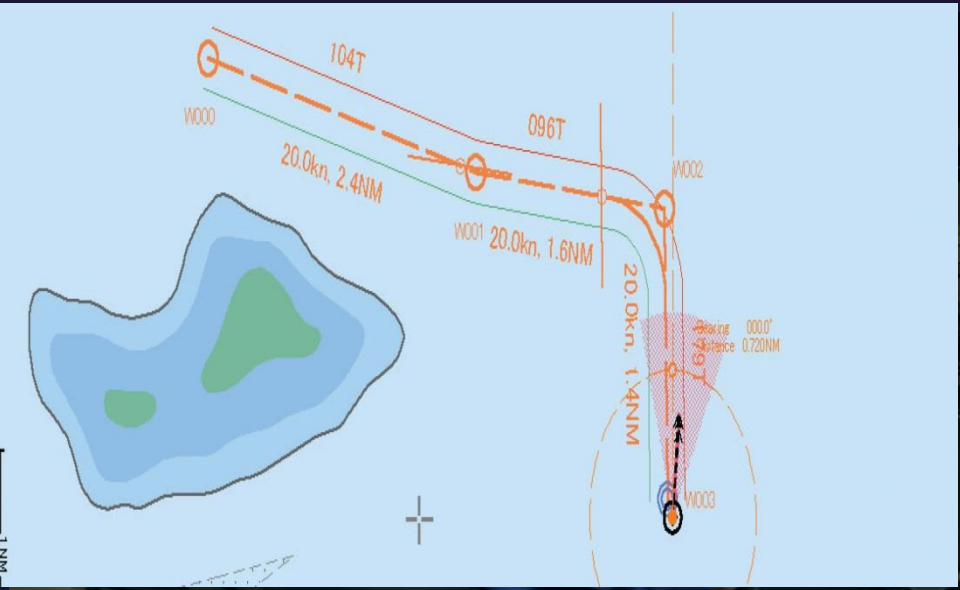
Digitalization could reduce fuel consumption →

Emission

Digitalization could reduce fuel emission →

Environment

Reporting

Autonomous operation, digitalization could help

Autonomous operation

Wave n

Wave 4

Remote controlled plus autopilot

Wave 3

Remote controlled with reduced human influence

Wave 2

Remote controlled with human operator nearby

Wave 1

Today

Remote supported

Thanks for your attention

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Where are we in Efficiency & Emission

EcoMAIN Suite

Challenge – Immense amounts of data available, but mostly unused

Solution – Data capturing from different onboard systems in one common database and central point of visualization

Benefits – Transparency of the status onboard. Comparable information over different systems. Fleet management optimization onshore.

- 2 % CO_2	Transparency of status

Waste Heat Recovery

Challenge – Capture energy losses in a complex system

Solution – AI data model optimizing plant operation. Bring uptime to an optimum and get better planning of cleaning measures to improve the efficiency.
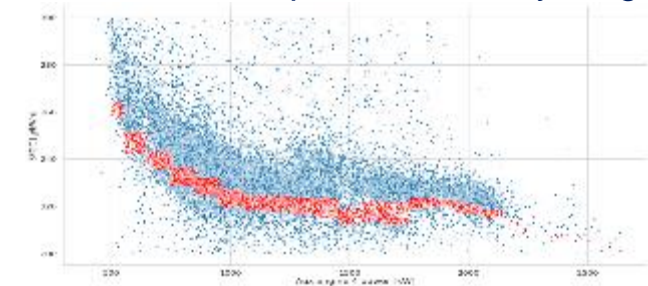
Benefits – Forecast of utilization and maintenance. Crew supported in their decision.

- 4 % CO_2	Decision Support

Efficiency Advisor

Challenge – Smart operation of energy sources in the optimal efficiency range

Solution – AI data model of combination of energy sources (incl. new energy sources e.g. fuel cells) to improve overall efficiency.

Benefits – Crew support in energy plant operation to get the highest overall efficiency.

- 5 % CO_2	Decision Support

Where are we in
Life Cycle Cost - PdM & PvM

Remote Service	Scuffing Detection	Condition Monitoring

Challenge – Various expertise required onboard.

Challenge – Unplanned maintenance and engine down time.

Challenge – Complex plants and proper maintenance planning.

Solution – Integration of modern IT tools like HoloLens into the EcoMAIN platform make use of features like AR support and assistance.
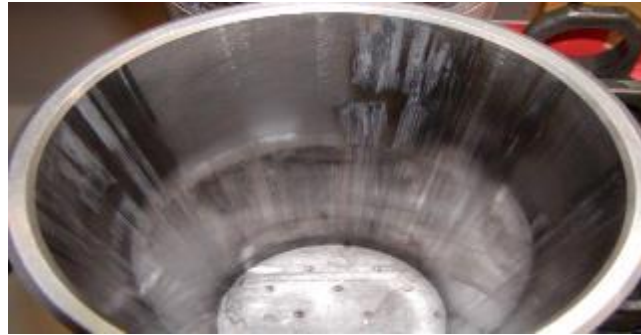
Benefits – 24/7 global availability of expert knowledge.

Solution – Search for anomalies in measurements by machine learning algorithm.

Benefits – Time (7 days) for countermeasures
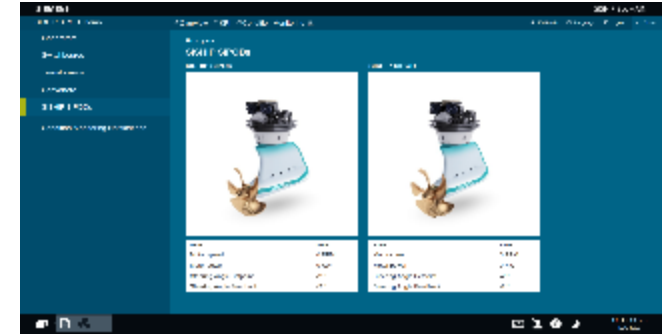
Solution – Condition monitoring for e.g. SISHIP SiPOD to monitor different parts of the plant.

Benefits – Predictive decisions and preventive maintenance approach.

Minimizing repair time	- 18 % maintenance cost per incident

Avoiding unplanned maintenance	- 3 % OPEX

Improved availability	- 2 % OPEX

Where are we in Sustainability

Emission Tracker

Challenge – Measurement and regulations: essential reporting of emissions

Solution – IoT sensors to measure emissions per energy source. Report the emissions by onboard consumer. Forecast feature by usage of route planning and energy profiles.

Benefits – Situation related overview of emissions of energy sources.

| Emission Trading | Regulation conform |

Smart Spaces

Challenge – (Human) Monitoring under Covid-19 conditions (MIL)

Solution – Using IoT sensors like cameras, thermo scans, etc., to monitor, record and report the health status of humans and the hygienic concepts like social distancing.

Benefits – Monitor safety and health of passengers and crew.

| Back to operation | Risk mitigation |

Route Optimization

Challenge – Solving complex problems with multiple variables

Solution – Algorithm to find best route in perspective of time or fuel consumption by considering vessel status, weather-, sea- and traffic forecast.

Benefits – Efficient and sustainable routing.

| - 7 % CO_2 | Improved schedules |