



Pioneering AI-Driven Maritime Evolution

part of
QUALCO
Group



WHO WE ARE

Founded in 2019, Synthetica specialises in developing monitoring and optimisation tools for the maritime industry. We offer leading software solutions to key players in shipping, enabling them to closely monitor, deeply analyse, and optimise vessel operations. Our aim is to support clients with groundbreaking, scalable, AI-driven solutions crafted for global applications.

OUR PRODUCTS & SOLUTIONS

Synthetica IEM

#intelligent_equipment_monitoring

Prioritise safety and efficiency with real-time vessel monitoring

Synthetica PEM

#predictive_equipment_management

Prevent damage by predicting issues before they escalate

Synthetica GAIA

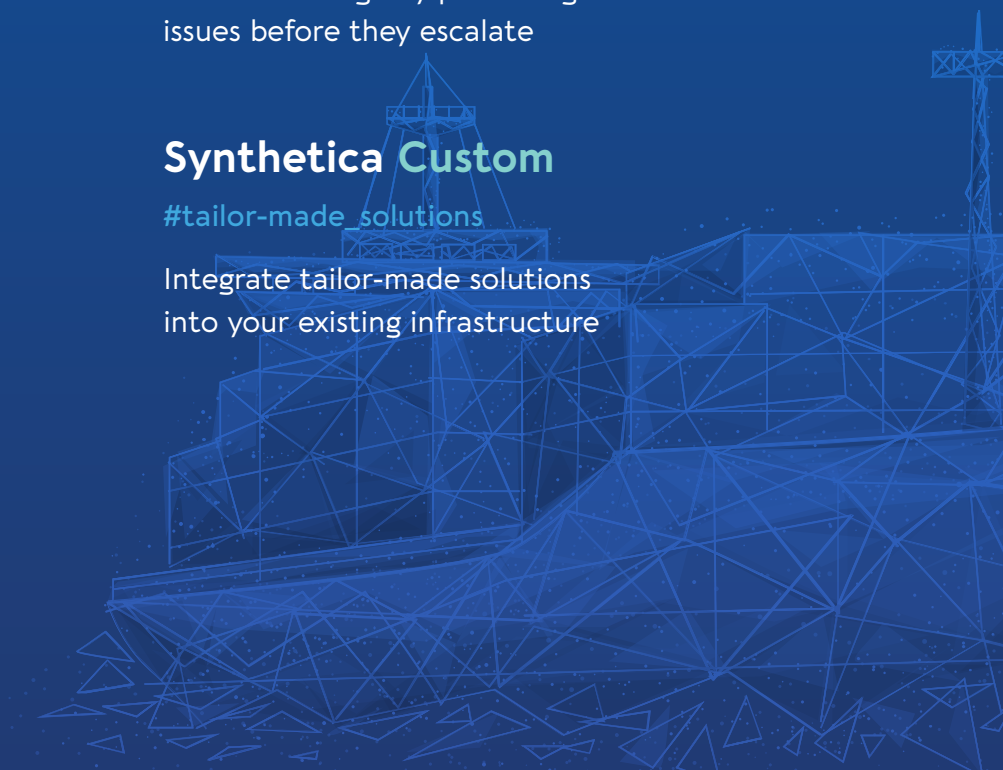
#genAI_digital_assistant

Make smart decisions using our custom generative AI tool

Synthetica Custom

#tailor-made_solutions

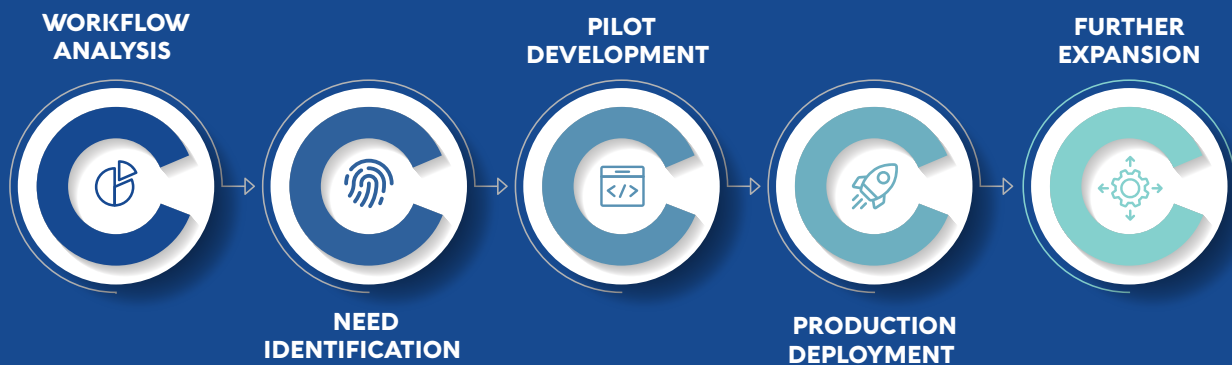
Integrate tailor-made solutions into your existing infrastructure



THE PLATFORM

Our products are accessed via a user-friendly and intuitive web platform which can be customised and adjusted to specific workflows to boost productivity and optimise costs. By analysing large data sets, the platform provides access to invaluable insights, empowering data-driven decision-making.

PRODUCT DEVELOPMENT JOURNEY



PART OF QUALCO Group

Synthetica is a proud member of [QUALCO Group](#), the leading AI-powered solutions and technology-driven services provider. Operating under the umbrella of **QUALCO Group**, we are committed to democratising AI and crafting maritime software tailored to our clients' needs.

WHY SYNTHETICA

POWERED BY INNOVATIVE TECHNOLOGY



AI & Advanced Analytics

Transforming raw data into actionable insights



Maritime Digital Twin

Providing real-time insights for predicting maintenance needs



Internet of Things

Enabling informed decisions via machinery connectivity



Big Data Infrastructure

Ensuring superior performance and resource optimisation

OUR IMPACT IN NUMBERS

300+

Vessels digitally mapped

100+

Data Points per Vessel

<1 Min

Data Collection Frequency

90%+

OEM Integration



CHAMPIONING EXCELLENCE

Trust us to:

- **Manage the entire process**, from installation to visualisation.
- Oversee the development journey, **from concept to implementation**.
- Ensure reliable and **secure installation** thanks to top industry methods.
- **Protect your data** via encryption and multi-layered cybersecurity protocols.
- Provide you with **valuable insights** via customised data analytics tools.

OUR CLIENTS

Synthetica is the go-to AI service provider for maritime leaders worldwide.



European
Global Navigation
Satellite Systems
Agency



PRODUCTS & SOLUTIONS

SYNTHETICA IEM

Our Remote Maritime Monitoring Solution prioritises safety, efficiency, and cost-effectiveness. Synthetica IEM operates continuously, enabling the remote monitoring of all vital vessel components and facilitating real-time data flow between onshore and offshore engineers. **We offer:**

- **Targeted Systems Monitoring:**
A solution tailored to your unique needs, enabling you to monitor individual vessel systems.
- **Complete Vessel Monitoring:**
A holistic asset monitoring service offering an all-encompassing view of your vessel.

HOW IT WORKS

- 1** **Collect** and **transmit** data onshore
- 2** **Process** and **cleanse** data
- 3** **Analyse** data, **generate** reports, and **present** findings on the platform

WHAT TO EXPECT

REMOTE MONITORING

- » Monitor critical vessel systems to improve operations and reduce downtime.

DATA-DRIVEN DECISIONS

- » Empower informed decisions with real-time data and historical trends.

REGULATORY COMPLIANCE

- » Collect data, gather insights and generate reports to remain compliant.

FLEET OPTIMISATION

- » Streamline fleet operations and maximise productivity across vessels.

GUARANTEED SUSTAINABILITY

- » Improve resource management and minimise environmental impact.

SYNTHETICA IEM TOOLKIT

- Receive **alerts in real-time**.
- Get valuable **operational insights** for critical vessel systems.
- Analyse trends and **track performance** leveraging historical data.
- Meet **regulatory requirements** by automating data collection and reporting.
- Adjust to **different vessel systems** and OEMs.
- Integrate with **multiple sensors**, facilitating system monitoring.

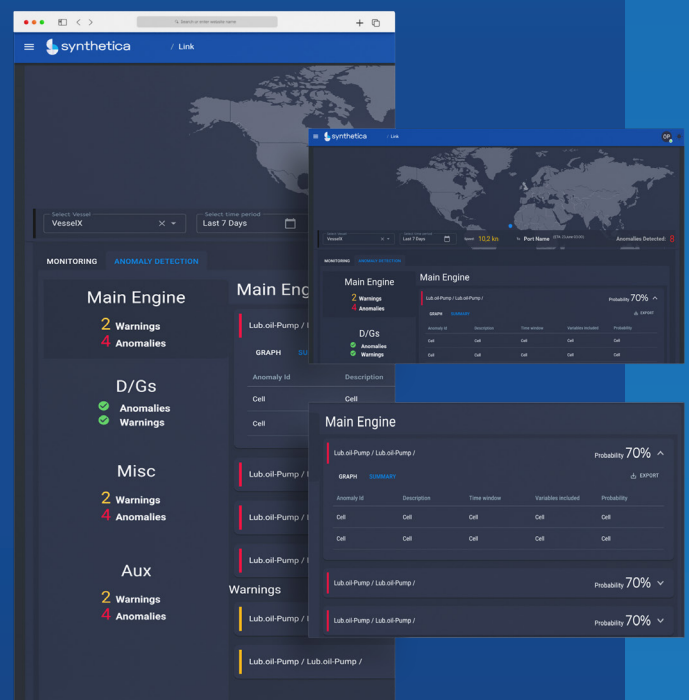
USE CASE

ACTIVATION OF “WATER IN OIL HIGH-HIGH” ALARM

A Bulk Carrier (Kamsarmax) experienced a leak that caused engine oil contamination with seawater. The vessel crew took no action for over 10 hours. Synthetica’s automated monitoring software detected the issue and notified the responsible onshore engineer, preventing significant engine damage.

COST SAVINGS

Potential savings of millions of USD in damages and loss of hire. A similar incident on a vessel not equipped with the system led to catastrophic M/E damage.



SYNTHETICA PEM

Using neural network technology, the Anomaly Detection Tool identifies patterns in vessel machinery data and detects any irregularities. By integrating with Planned Maintenance Systems (PMS), the tool identifies potential faults, malfunctions, or abnormal behaviour in most mission critical components.

HOW IT WORKS

- 1 Collect data** from sensors & other machinery sources.
- 2 Train** a proprietary unsupervised learning **algorithm** using historical data.
- 3 Deploy the model** for real-time operation and accessibility on the platform.
- 4 Evaluate, fine-tune and adjust** hyperparameters using labelled data.

WHAT TO EXPECT

- COST REDUCTION** » Predict and address machinery issues before they become failures and minimise repair costs.
- ENHANCED SAFETY** » Ensure the reliability of critical systems and prevent damage.
- CUSTOM SUPPORT** » Provide tailored help for varied vessels and equipment remotely.
- SUSTAINABILITY BOOST** » Reduce downtime and lower operational costs.
- FLEET OPTIMISATION** » Streamline maintenance to extend components' life and avoid incident repetition across fleets.

SYNTHETICA PEM TOOLKIT

- Track vessel systems and **detect irregularities** continuously, in real-time.
- Connect with multiple sensors and data sources for **holistic monitoring**.
- Forecast equipment needs and adapt for **proactive maintenance scheduling**.
- Investigate issues**, assess failure probabilities, and prioritise maintenance.
- Guarantee data transmission and storage **compliance with security standards**.
- Leverage large data pools from similar vessels for **performance benchmarking**.

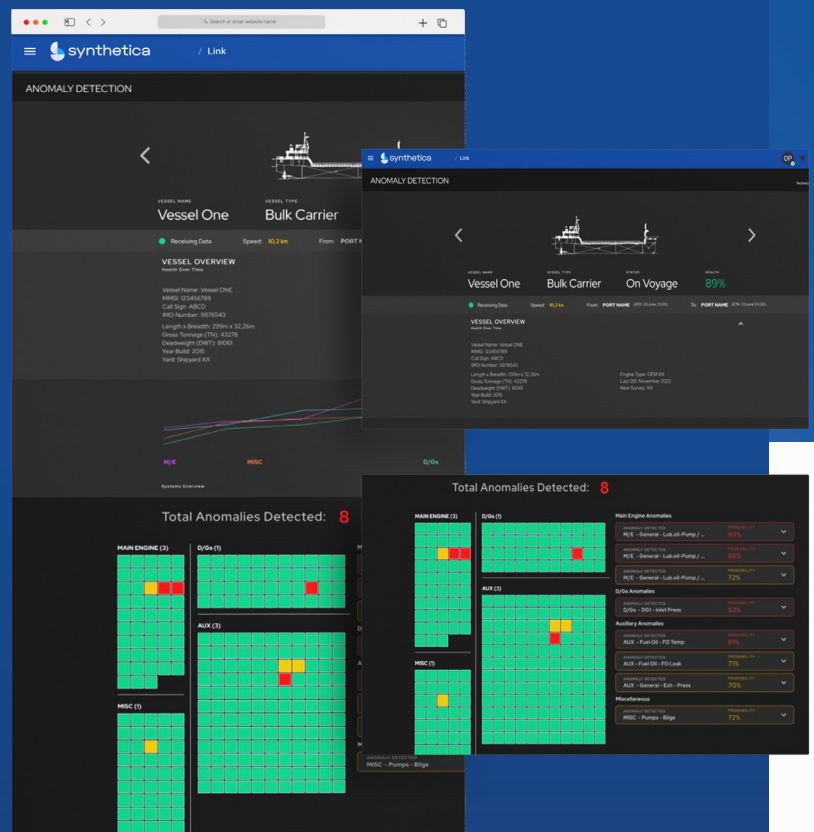
USE CASE

RECURRING ACTIVATION OF THE “M/E ALPHA LUBRICATOR” ALARM

Our tool’s ‘Analytics’ capability identified an anomaly in the operation of Alpha Lubricator’s alarm on 4 Bulk Carriers, resulting in office-initiated Alpha Lubricator maintenance. Addressing this prevented the M/Es from operating with an incorrect cylinder oil feed rate, which could lead to excessive wear of cylinder liners, piston rings and piston crowns.

COST SAVINGS

The cost to replace the items mentioned is estimated at USD 12.000 per cylinder after a single long voyage. The affected vessels have 7-cylinder engines, so the potential savings surpass USD 80.000 per vessel. Additionally, incorrect operations could escalate lubricant consumption by as much as 70%.



SYNTHETICA GAIA

Our digital assistant is a custom Large Language Model (LLM) that ingests proprietary data from a user's knowledge base. This includes operational and equipment manuals, process descriptions and more. Leveraging knowledge from internal documents and databases, the tool improves operational efficiency, decision-making and organisational safety.

HOW IT WORKS

1

Examine the **current workflow** to pinpoint integration points

3

Enable the digital assistant to **access files** and **databases**

2

Establish **tailored infrastructure**, either on the cloud or on-premises

4

Configure and **customise** the tool to perform in selected languages

WHAT TO EXPECT

ENHANCED DECISION-MAKING

» Access data quickly, save time and make smart decisions.

INCREASED PRODUCTIVITY

» Streamline manual admin tasks and generate reports.

CUSTOMISATION OPTION

» Tailor the platform to your needs for optimal performance.

SAFETY BOOST

» Follow best practices to promote a safer work environment.

DATA VALUE MAXIMISATION

» Leverage your data for valuable insights and strategic actions.

SYNTHETICA GAIA TOOLKIT

- **Collect comprehensive information** by integrating various data types from content repositories.
- Execute operational and managerial tasks by **ingesting technical** and **commercial information**.
- **Receive responses in various output formats**, either free text or custom ones.
- Ensure maximum data protection via **inherent closed design**.
- **Integrate seamlessly** into existing infrastructures, including API options.

SYNTHETICA CUSTOM

We transform complexities into straightforward processes by creating solutions tailored to your unique needs. Our offerings integrate smoothly into existing infrastructures, enhancing workflows and operations. Some indicative custom tools we have implemented are:

DRYDOCK COST MANAGEMENT TOOL

Allows the effortless planning and follow-up of all Dry Dock processes, from initial scheduling to final reporting. With its intuitive design and various features, the tool enables seamless work progress and expense tracking at the shipyard and the office. This way, it ensures efficiency and eliminates delays and overcharges.

CREW CHANGE PLAN

Equipped with a dashboard that tracks qualifications and training, the tool manages commercial vessel crews while ensuring seamless rotations and policy adherence. The built-in decision-making modules streamline operations, making it the go-to solution for maritime crew management.

MAINTENANCE SCHEDULER

Enables ship owners and fleet managers to schedule and plan inspections, ensuring alignment with maritime industry standards. The user-friendly tool auto-stores certificates issued by the authorities, aiding both execution and post-review.



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Discover the future of Maritime AI

www.synthetica.ai