The Aura of applied data accuracy

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The maritime industry is experiencing a significant period of transition. The introduction of increasingly ambitious regulatory frameworks, as well as concrete commitments to adopt more sustainable operations that drive decarbonization, has placed current industry practices under the spotlight. At the same time, significant technological advancements and increasingly more sophisticated systems, amidst the onset of industry digitalization, are enhancing operational efficiencies across a range of different sectors.

The shipping industry creates a vast amount of operational, commercial, and environmental data. Despite this, the sector has been largely left behind by the digital transition that other industries have benefited from, still often relying on outdated systems that fail to harness the power of modern digital solutions. This failure to grow with the latest advances in technological innovation has led to a seeming acceptance of operational practices that other industries would not.

The shift to digital couldn't be more timely, especially as the industry confronts the pressing challenge of the climate crisis. Digitalization can enhance and accelerate the energy transition. Heightened stakeholder pressure, a stricter regulatory environment, and the reality that scalable alternative fuels are still years away have forced the industry to double down on energy efficiency. To achieve the International Maritime Organization's greenhouse gas emission reduction targets, the industry is having to consider new technologies (including ship upgrades) and infrastructure interventions (low-carbon bunkers). Additionally, the shipping sector must implement methods to measure and validate the impact of these modern technologies.

In response to this, we marine engineers and consultants at Elomatic have partnered with Europe's largest artificial intelligence (AI) lab, Silo AI (part of AMD), to develop the Aura Asset Performance Management (APM) system, a highly customizable, 360-degree solution that is designed to utilize advanced AI technologies to support enhanced operational efficiency.

Moving beyond just ticking the box

The current industry standard for computerized maintenance management systems in maritime operations is a regulatory requirement for accessing and sharing data. These systems are often seen as unhelpful obligations, which reduces their utility to basic 'tick box' exercises.

Yet, with a shift in approach, current maintenance management can evolve into essential tools that enhance operational efficiency with minimal intervention. By engaging with new and innovative technologies, the maritime industry can harness the wealth of data insight that is available. Through a combination of high-quality data from crew inputs and equipment sensors, these systems could significantly improve vessel operations by providing better overall awareness.

For instance, traditional maintenance practices hold to rigid schedules with the aim of preventing costly breakdowns. However, these processes often rely on outdated inventories and scattered documents, which can compound busy workloads and still result in breakdowns at sea.

Optimizing maintenance schedules through clean, accurate, and accessible sensor data provides a clear picture of where & when maintenance is truly needed.

While sensor data plays a significant role, it is part of a broader preventive maintenance strategy that also benefits from manually imported data, equipment history, and general usage. Our evolving approach aims to enhance this process with more intelligent solutions, minimizing unnecessary interventions, reducing costly downtime, and improving safety.

Implementing the unthinkable

With accurate data and measurements, consistent methodologies, and real-time information, systems such as Aura can identify the small margins that will achieve savings with a degree of accuracy that would have been unthinkable just a decade ago.

Advancements in high-speed connectivity now allow for real-time intervention from land-based teams, supporting decision-making that was once confined to onboard crews. This includes ensuring necessary inventory is always at hand, enabling transparent collaboration between environments, and maintaining a clear digital trace of actions & operations on board. Ultimately, the integration of machine learning and AI within an APM system is likely to greatly increase the scope and application of the data that can be gathered in the future.

By integrating advanced AI models into APMs like Aura, the model plays a crucial role in the stages following initial data access (including consolidation, harmonization, utilization, and analysis). This enables shipowners and operators to adjust routing speeds, establish operational parameters that reduce emissions, and optimize entire fleets effectively.

Leveraging engine sensor data integrated into the platform, Aura can provide automated service planning, resource allocation, and supply chain management functionalities. This capability allows for proactive maintenance and optimal resource utilization, ultimately improving operational efficiency for those owning and operating ships. More than just an APM system, Aura represents an intelligent cloud solution that integrates with a vessel's existing computing capabilities and onboard IT infrastructure.

The incorporation of machine learning and AI within the APM framework may significantly expand the scope and application of the data that can be collected and analyzed in the future. In time, Aura will evolve to offer actionable asset health information and maintenance support, further transforming how the maritime industry approaches operational efficiency and sustainability.

Aura is designed to simplify asset management by offering comprehensive data insights. One of its key features is its 360-degree approach, which integrates maintenance, repair, and optimization processes into one user-friendly platform. By streamlining inventory management, planning and scheduling, the system not only saves time but also reduces operational costs, helping operators avoid unplanned downtime.

Clarity and confidence

As AI technology continues to develop, the maritime industry stands to benefit from enhanced decision-making capabilities, improved resource management, and a more sustainable operational framework. This revolution will not only optimize efficiencies but also position the industry to meet the pressing environmental challenges it faces today.

Aura provides a clear example of how modern digital solutions can provide the clarity and confidence needed to navigate this period of significant transition within the maritime industry. The goal of Aura is not to introduce complex software integrations that compound busy workloads. Instead, it is a tool that aligns with existing systems, enhancing the tonnage's lifetime value, reducing costs, and supporting more operationally sustainable & safer vessels.

The maritime industry must move on from outdated maintenance practices and fully embrace the digital transition. Utilizing clean, accessible, and digestible data from the ship's sensors, whilst including user-originated logs of action, work order reports, and documents, is a necessary step towards a more sustainable and energy-efficient future. ■