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Shipping has digitised reporting — but not decision-making

By Dr Suhas Vhanmane, IRClass / 📅 28 days ago

Shipping has embraced digital reporting, but many operators are still making decisions using fragmented data and manual workflows. Dr Suhas Vhanmane argues that the next stage of maritime digitalisation lies not in collecting more information, but in transforming data into operational intelligence.

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The maritime industry has made significant progress in digitising compliance processes over the past decade. From IMO DCS and EU MRV reporting to emissions monitoring and sustainability disclosures, digital tools are now widely used to manage growing regulatory requirements across shipping operations.

Yet despite this progress, many organisations remain far from true digital transformation.

In practice, much of the industry has digitised paperwork rather than decision-making.



Dr Suhas Vhanmane

This distinction is important because the pressure facing shipping companies today extends well beyond reporting deadlines. Decarbonisation targets, operational efficiency demands, fuel cost volatility and increasingly complex regulatory frameworks are all placing greater emphasis on the quality, accessibility and usability of operational data. Collecting data is no longer enough. The real value lies in understanding what the data is saying and using it to support better operational decisions.

Across the industry, many companies still rely heavily on manual workflows beneath a digital surface. Paper-based forms are converted into digital templates, spreadsheets are uploaded into reporting systems, and data is entered manually into software platforms designed to support compliance. While this creates a more organised reporting environment, it does not necessarily create operational intelligence.

In many cases, the process effectively stops once the data has been submitted or stored.

The result is that organisations accumulate large amounts of potentially valuable operational and emissions data without fully using it to improve performance, streamline workflows or strengthen decision-making. The data exists, but the insights remain largely unexplored.

This challenge is becoming increasingly visible as compliance requirements expand. Regulatory frameworks such as IMO DCS and EU MRV have accelerated the adoption of digital reporting tools, but they have also highlighted weaknesses in data quality, integration and governance. Shipping companies today often manage multiple disconnected datasets across noon reports, bunker delivery notes, AIS feeds, GPS systems, engine performance records and planned maintenance systems. When these systems operate independently, inconsistencies emerge and confidence in the data begins to erode.

A common example is fuel oil consumption reporting. Data collected manually through noon reports may differ from measurements recorded through flow meters or automated systems. Missing entries, duplicated records or out-of-range values can create additional uncertainty. Once this happens, the organisation spends more time validating data than using it to generate operational insight.

This is where many digital transformation programmes struggle.

The focus often remains on creating a reporting mechanism rather than developing a decision-support system. There is an important difference between the two. A reporting tool aggregates historical data to satisfy compliance requirements. A genuine decision system uses that same data to identify operational patterns, assess performance and support optimisation strategies.

The difference is particularly relevant in the context of decarbonisation.

Shipping companies are now expected not only to report emissions, but also to demonstrate continuous improvement in fuel efficiency and environmental performance. This requires a deeper understanding of how operational decisions influence fuel consumption and emissions across voyages, weather conditions, routing profiles and vessel configurations.

A more advanced digital framework can support this process by integrating operational analytics such as trim optimisation, weather routing, predictive maintenance and just-in-time arrival planning. Instead of simply recording what happened during a voyage, these systems can help operators understand why performance changed and which factors can be controlled to improve efficiency.

However, this level of insight is only possible when the underlying data foundation is reliable.

The industry therefore needs to move beyond fragmented and manually intensive data collection methods toward more automated and integrated systems. Sensor-based data collection, near-real-time monitoring and centralised platforms represent an important step in this direction. The concept is straightforward: data should move seamlessly from sensor to dashboard with minimal manual intervention.

This is where digitalisation begins to create real operational value.

When high-quality data becomes available consistently, organisations can deploy automated validation checks, integrate multiple operational datasets and apply advanced analytics with greater confidence. The result is not only more efficient compliance reporting, but also improved transparency and stronger operational decision-making.

At the same time, technology alone will not solve the problem.

One of the most underestimated aspects of maritime digital transformation is change management. The challenge is not simply implementing new software or installing additional sensors. Digital transformation represents a broader organisational and cultural shift in how data is collected, interpreted and used across the business.

This transition affects operational personnel, technical teams, shore management and decision-makers alike. Without involving process owners and data stakeholders early in the transition, even technically strong digital initiatives may struggle to achieve long-term adoption. Resistance to change, inconsistent workflows and unclear responsibilities can undermine otherwise capable systems.

In this respect, digital transformation in shipping remains in a relatively early stage of maturity. Many organisations are still evolving from traditional operational models toward integrated digital ecosystems. The success of this transition depends heavily on whether companies are prepared to align people, processes and technology together rather than treating digitalisation purely as a technical upgrade.

This becomes particularly important as the industry prepares for the next phase of environmental regulation and operational optimisation. Sustainability reporting requirements are becoming more extensive, while commercial pressure to improve efficiency continues to grow. At the same time, cybersecurity concerns and data governance expectations are increasing across the maritime sector.

Against this backdrop, scalable sustainability data foundations will become increasingly important. Companies that continue relying on fragmented manual reporting processes may find it difficult to adapt to future requirements efficiently. In contrast, organisations investing in integrated, automated and operationally useful data systems are likely to be better positioned to manage both compliance and performance expectations.

Importantly, the objective should not be digitalisation for its own sake.

The real purpose of digital transformation is to improve operational understanding and support better decisions across the organisation. If digital systems simply replicate existing paperwork in electronic form, the industry risks creating more data without generating more intelligence.

The maritime sector has already demonstrated strong willingness to adopt digital tools in response to regulatory pressure. The next step is to ensure that these tools evolve from passive reporting platforms into active operational decision systems.

That transition will define the difference between companies that merely comply with the next reporting deadline and those that build a sustainable operational advantage from their data.

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