

Drowning in the Sea of Data?

by Ewa Kochańska

The report *The Great Integration: How connected maritime technology is unlocking compounded value across performance, compliance and operations*, by Danelec and Thetius, offers an industry-wide analysis of how digitalisation shapes decision-making in shipping. The assessment shows that the gap lies not in data availability but in fragmentation: disconnected systems prevent data from forming a coherent operational picture – even as commercial pressures, environmental regulation, and operational performance grow increasingly intertwined.

Most shipping companies have invested heavily in digitalisation, and the results are visible. From voyage optimisation and performance monitoring to emissions reporting and compliance platforms, operators today have more data at their fingertips than ever before. Yet all this investment has not delivered the expected leap in decision-making. Data remains locked in separate systems, forcing teams to piece together the full picture themselves.

Meanwhile, a decision that once came down to choosing the most efficient route and perhaps only affected fuel costs and schedules, today affects emissions, regulatory requirements, and the commercial result. With new rules adding yet more considerations to everyday operations, the real challenge is no longer finding information but making sense of it. The next step in maritime digitalisation may therefore have less to do with investing in newer technologies and more to do with getting the ones already in place to work together.

Tech itself is not the problem

Until recently, if a vessel underperformed, it simply triggered a routine charter party claim. Today, it can become far more complicated. In one example highlighted by the report, a performance dispute soon expanded to include liability under the EU Emissions Trading System (EU ETS). What had originated as a technical issue suddenly carried commercial and regulatory consequences, involving far more people than just the operations team.

That example captures a much wider shift taking place in the sector. Operational decisions that were once made in isolation now have implications that reach well beyond a single voyage. The result is that decisions which were once considered routine have become business-critical. This does not mean the industry has fallen behind on digitalisation – quite the opposite. Over the past decade, shipowners have invested heavily in voyage optimisation, performance monitoring, emissions reporting, and compliance software. The problem is

that these tools were generally introduced to solve individual operational obstacles rather than to support a single, connected decision-making process.

As the number of systems has grown, so has the complexity of using them. Every new application brings its own data, workflows, and reporting requirements – and instead of simplifying operations, teams spend more time reconciling information across platforms. More data has not solved this: data quality varies, much of it still relies on manual input, and the proliferation of dashboards can overwhelm rather than clarify.

The regulatory situation has made this even more demanding: the International Maritime Organization's Carbon Intensity Indicator, the EU ETS, and FuelEU Maritime (FEUM) have transformed emissions from a reporting exercise into a commercial consideration. Even minor changes in fuel consumption or voyage planning can now have a direct financial impact, forcing companies to weigh operational capability, compliance



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obligations, and business performance at the same time. As regulations continue to expand, interpretation has become almost as important as implementation, drawing legal, commercial, technical, and IT teams into decisions that were once outside their respective scope.

This challenge is not unique to shipping. Other industries have found to their cost that more information does not automatically produce better decisions. Without clear governance and well-defined decision processes, additional data can simply create more noise. Shipping is particularly vulnerable because commercial and operational decisions often need to be made quickly. When information arrives late or requires interpretation, people naturally fall back on experience and judgement rather than relying on digital tools.

As a result, fragmentation sits at the heart of the problem. Most shipping companies rely on specialist software for performance management, voyage optimisation, compliance reporting, and commercial planning. Each application performs its own task well, but they are rarely designed to provide a single, shared view of performance. The situation is made even more complicated by regional regulations such as the EU ETS, its UK counterpart, and FEUM, each of which requires different

calculations and reporting approaches. The result is an environment where valuable information exists but remains scattered across disconnected platforms.

Technology, however, is only part of the picture. Different departments often work towards different objectives. Performance teams focus on fuel efficiency, operations prioritise schedule reliability, while commercial teams are measured against revenue and contractual performance. Although these priorities are more interconnected than ever, they are not always managed together. Decisions that improve one metric can unintentionally weaken another, particularly when regulatory obligations and commercial realities are not aligned – as is often the case. The growing compliance burden can also filter down to crews, who face an increasing number of procedures without always understanding the wider commercial purpose behind them – adding to an already heavy workload.

Managing fleets with diverse technologies adds another layer of complexity. Many owners operate a combination of modern vessels loaded with advanced digital capabilities alongside older ships with more limited technology. As data quality and availability vary across the fleet, consistent, quick decision-making becomes difficult.

Prioritise decision-flow clarity before tech redesign

With fragmented data as the culprit, better integration is the obvious hero. But is connecting software really enough? The actual goal is to give decision-makers a complete picture of what is happening, bringing together operational, commercial, and compliance information so they can act quickly and with confidence. However, that requires a different perspective on digitalisation, as too many integration projects focus on moving data from one platform to another, rather than on how people actually use that information.

The first step is understanding how decisions are actually made. Too often, digital projects begin with selecting new technology. Instead, they should examine where information gets delayed, where responsibilities overlap, and where people still rely on experience because systems do not provide clear answers. The biggest obstacle is not a single piece of software but the gap between systems, where information has to be gathered, interpreted, and adapted before anyone can act.

That is why it's recommended that companies improve decision flows before they redesign their technology. Small, targeted projects can reveal where better data sharing genuinely helps people make faster and more



confident decisions. Early successes also establish trust, making it easier to expand new ways of working across the organisation instead of forcing change through large, expensive transformation programmes.

Fragmentation should not be seen as something that can disappear overnight. During any transition, old and new systems will inevitably operate side by side. Rather than trying to eliminate that reality, companies can reduce its impact by making information easier to access, improving interoperability, and developing a consistent view of performance across multiple systems. In practice, connecting existing systems delivers greater value than replacing them.

Technology alone, however, is only part of the answer. Better decisions also depend on clear ownership of data, well-defined responsibilities, and confidence in the information being used (alongside proper cybersecurity hygiene at every level). Without that, even the most excellent digital tools will fail to provide proper information for everyday operations. As the report points out, success depends just as much on people adopting new ways of working as it does on the technology itself.

Perhaps the biggest lesson is that digitalisation should support the way a business makes decisions, not force the business to adapt to the technology. Systems can reduce uncertainty and make trade-offs easier to understand, but they cannot replace

experience or judgement. In the end, the companies that gain the most from digitalisation are likely to be those that focus less on buying the next platform and more on helping their workers make better business decisions every day.

Focus on high-impact areas

Since the problem seems to circle around the fragmented way in which information is collected, shared, and used, the next stage of maritime digitalisation is unlikely to be about adding more lines of code. The report lists a few handy recommendations.

Start with decisions, not technology. Before investing in new systems, companies should understand how decisions (around speed management, routing, fuel selection, emissions strategies, etc.) are made today, who is involved, where information is delayed or missing, and where there is uncertainty. Focusing first on high-impact decisions allows organisations to target the areas where better integration will have the biggest effect while avoiding unnecessary system redesign. Integration should begin with the concrete aspects of daily operations, making sure that the right information gets to the right people at the right time.

Next, strengthen governance and accountability. Even the best technology cannot compensate for unclear data ownership or conflicting objectives. Performance, commercial, and compliance teams often

work towards different targets, making it difficult to balance competing priorities. Clear governance, defined data ownership, consistent validation processes, and transparent decision processes help organisations make faster and more dependable decisions while building confidence in the information that supports them.

Last, improve gradually. Fragmentation is a reality for most shipping companies. Mixed fleets, legacy systems, and evolving regulations mean different technologies will coexist for years. Incremental improvements – testing integration around specific decisions, demonstrating benefits, and expanding from there – reduce risk while maintaining operational stability.

Make data great again!

Ultimately, a shortage of digital tools or operational data isn't what holds shipping back. The sector suffers from the absence of a clear, shared picture at the moment decisions need to be made. Genuine progress comes when technology, governance, and business priorities work together to support the decisions people make every day.

However, as the Danelec-Thetius report points out, no digital platform will get rid of difficult commercial choices or eliminate competing priorities. What technology can do is make those trade-offs visible – and that may be the most valuable digitalisation the shipping industry has yet to achieve. ■