



ORCHESTRATING EFFICIENCY: AN INTEGRATED VOYAGE OPERATIONS SUITE

How to simplify decisions and enhance performance through a unified platform for commercial operations

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ACRONYMS

- ▶ Application Programming Interfaces (APIs)
- ▶ Artificial Intelligence (AI)
- ▶ Carbon Intensity Indicator (CII)
- ▶ Commercial Control Tower (CCT)
- ▶ Commercial Voyage Management
as a Service (CVMaaS)
- ▶ Disbursement Accounting (DA)
- ▶ Enterprise Resource Planning (ERP)
- ▶ European Union Emissions
Trading System (EU ETS)
- ▶ Integrated Maritime Operations
System (IMOS)
- ▶ International Maritime
Organization (IMO)
- ▶ Machine Learning (ML)
- ▶ Notice of Readiness (NOR)
- ▶ Ship to Ship (STS)
- ▶ Statement of Fact (SoF)
- ▶ Voyage Management System (VMS)
- ▶ Voyage Operations Suite (VOS)

FOREWORD

In commercial shipping, complexity is a constant – but clarity is a choice. As the demands on voyage operations continue to grow, so does the need for connected systems, transparent workflows, and timely decisions. We are increasingly seeing a new generation entering the world of shipping-professionals who are used to mobile-first tools and instant access to information in their everyday lives. Yet, shipping software still feels stuck in time. Many of the systems we rely on remain fragmented, outdated, and difficult to navigate.



SANJAY KAPOOR,
CEO, GeoServe

At GeoServe, we are pleased to support Thetius in the second edition of their research, exploring how shipping can move beyond fragmented tools and toward more unified, intelligent workflows. This report introduces the concept of a Voyage Operations Suite (VOS) – a single tool that brings together the key workflows of commercial voyage operations. From bunker procurement, port disbursement to laytime negotiations, vessel performance, emission regulations, voyage optimisation, and analytics – a VOS connects it all under one smart, scalable platform.

In our previous collaboration, *Charting a Profitable Course*,¹ we explored the operational fragmentation that many voyage teams contend with daily. Since then, we've seen growing momentum across the industry to simplify, connect, and consolidate. What was once a vision is now being actively pursued by forward-thinking operations teams – not just through digital tools, but by redesigning workflows to better serve commercial outcomes.

This report shines a light on that shift. It focuses on the evolving role of the operations function—from task execution to orchestrating decisions that impact profitability, compliance, and long-term competitiveness. In doing so, it underscores that integration is not just about software – it's about empowering teams to act with speed, accuracy, and confidence.

“Office 365 made daily work simpler, faster, and smarter. A Voyage Operations Suite (VOS) can do the same for commercial operation teams – unifying workflows, removing inefficiencies, and empowering better decisions.”

Across the insights gathered, one message is clear: the path to smarter operations doesn't lie in adding more tools, but in making the ones we already use work better together. Integration is becoming the enabler of agility, and operational excellence is increasingly defined by how well departments align – not just how well they perform in isolation.

We hope this research provides valuable perspective to CIOs, Heads of Operations, and Business Process leaders who are looking to simplify their tool stack and strengthen decision-making at the core of voyage execution.

Whilst there is growing interest in the use of AI and automation, I believe the competitive advantage in the next phase of commercial shipping will come from digital orchestration.

¹ Thetius (May, 2024) [Charting a profitable course](#)

INTRODUCTION

Shipping has always been operationally intense, but never has the pressure to do more with less been greater.

Each voyage involves hundreds of critical decisions around bunker procurement, laytime calculations, vessel performance, regulatory compliance, and more. These decisions directly impact profitability and competitive advantage. But across voyage operations teams, there's a growing recognition that managing fragmented tools, delayed decisions, and inconsistent data is not just frustrating, it's costly.

Yet, many shipping operators are still wrestling with a patchwork of disconnected systems, manual data entry, siloed teams, and information overload. Fragmented workflows don't just slow operations; they blindfold decision makers, leading to costly errors and missed opportunities.

In our previous report, *Charting a Profitable Course*, we examined how these inefficiencies create commercial risk. Since then, the landscape has only grown more complex. Regulatory requirements have tightened, markets remain volatile with ongoing trade wars, and internal teams are stretched thinner than ever to maintain competitive advantage.

At the same time, there is a clear shift underway. Operators are no longer looking to add more systems. Instead, they are looking for smarter, more connected ways to manage the ones they already have.

This report takes the discussion a step further, focusing on enterprise-wide transformation through unified systems such as a Voyage Operations Suite (VOS). A VOS brings together the core workflows of commercial shipping including bunker procurement, port disbursement, laytime management, vessel performance, voyage optimisation, and analytics into one integrated suite.

It's important to note that a VOS is different from a Voyage Management System (VMS) and is not designed as a replacement. Instead, it provides a way to make them work better, together. VMS platforms like IMOS focus on finance, accounting, and voyage Profit & Loss (P&L), similar to how an Enterprise Resource Planning (ERP) system functions in business. In contrast, a VOS acts more like Microsoft 365 for commercial shipping. It's a unified digital workspace designed to boost day-to-day productivity, improve visibility, and reduce operational friction.

This report explores the growing need for such solutions and offers practical guidance for organisations evaluating platforms that are built to unify and streamline commercial voyage operations. It draws on firsthand insights from operators, charterers, and commercial leads, and presents a roadmap for moving from fragmented systems to more integrated and intelligent operations.

The key aims of the report are to:

- ▶ Explore the inefficiencies in voyage management that generate commercial risk.
- ▶ Examine the benefits of a VOS for commercial voyage management.
- ▶ Explain how a VOS differs from a VMS and why it is not a replacement.
- ▶ Recommend practical steps to move from fragmented to intelligent operations for more efficient and profitable voyage management.

DECISION MAKING IN THE DARK: THE CHALLENGES AND COMPLEXITIES OF MODERN COMMERCIAL OPERATIONS

The commercial aspect of a voyage today is highly complex, involving many different stakeholders and a multitude of systems, processes, and technologies. A commercially attractive voyage requires decision-making based on timely and accurate information, but this isn't always easy to obtain. This section delves into some of the key challenges faced by voyage operations teams today and examines the impact on effective decision-making and competitive operations.

DATA SILOS AND INTEGRATION FRICTION

Voyage operations rely heavily on speed, accuracy, and coordination. Yet, many operations teams use more than 15 different tools, platforms, or websites to manage a single voyage.

The issue is not just the number of tools. It's that they rarely speak to each other. Updates made in one system often don't sync with others. Information gets trapped within departments, and operators are forced to fill in the gaps themselves. "This creates integration friction, rather than true interoperability," Mads Frank Markussen, Head of Freight Research and FFA at Navi Merchants, told Thetius.

The impact of this fragmentation is significant. For example, a port agent might submit a revised proforma with updated costs, but the DA handling team working off the

original charter party terms in a separate system, may miss those changes. Without a shared view, deviations go unnoticed until after the voyage is completed, making cost recovery difficult or sometimes time-barred.

As systems aren't connected, people become the connectors, switching between emails, spreadsheets, and dashboards to pull together the full picture. Often, by the time they do, the data is already outdated or contains errors.

"Managing a single voyage as an operator required multiple different disconnected systems. For a simple task like deciding where and how much bunkers to buy, I'd need to check the itinerary, the charter party, bunker prices, vessel capacity, congestion, and weather across multiple platforms, just to book bunkers," Cyrus Mistry, Former Vessel Operator, now General Manager – BI & Data Governance, GeoServe, told us.

In the end, every team builds its own view of the voyage. But without shared, up-

to-date information, departments end up misaligned. The result is slower response times, missed opportunities, and decisions made on partial or outdated data, all of which carry a real operational and financial cost.

The following outlines some of the systems and platforms that are used by a voyage operator to manage the commercial aspect of a single typical voyage:



VOYAGE PLANNING & EXECUTION



- ▶ Voyage Management System (VMS)
- ▶ Charter party management platform
- ▶ Distance tables
- ▶ Q88, Rightship summary and similar digital tools
- ▶ Tank or hold cleaning guides



BUNKERING & FUEL MANAGEMENT



- ▶ Bunker procurement systems (for booking and tracking claims)
- ▶ Bunker pricing websites
- ▶ Bunker avails, port restrictions and bunker risk/survey
- ▶ Bunker planner tools



PORT OPERATIONS & DISBURSEMENT



- ▶ Port Disbursement Accounting (DA) platforms (agency appointments, proforma approvals, cash flow)
- ▶ Vendor appointment tools or vendor marketplace
- ▶ Laytime calculation software



VESSEL PERFORMANCE & EMISSIONS



- ▶ Vessel performance monitoring systems
- ▶ Emissions compliance tools (CII, EU ETS, FuelEU)
- ▶ Weather and voyage optimisation tools
- ▶ Digital twins and hull condition monitoring



DATA & DECISION SUPPORT



- ▶ Analytics dashboards
- ▶ Excel-based data consolidation and reporting
- ▶ Operational issue logs
- ▶ Credit risk tracking sheets



DOCUMENTATION & COMPLIANCE



- ▶ Vetting and inspection tracking systems
- ▶ Pool portals (where applicable)
- ▶ Sanctions and counterparty compliance sites
- ▶ Document management systems
- ▶ SOP and repositories



COMMUNICATION & TRACKING



- ▶ Vessel position tracking software
- ▶ Email as the main collaboration tool
- ▶ Offline vessel forms and templates exchanged via email

MANUAL DATA ENTRY: A COSTLY TIME SINK

Another challenge operators face today is repetitive and manual administrative work. Inputting the same data across multiple platforms is not only time consuming, it is also prone to human error. The same information often needs to be re-entered into different systems or formatted separately for various stakeholders, including technical managers, charterers, and port agents.

“Manual data entry can account for up to 40% of an operator’s time,” explained Cyrus Mistry, Former Vessel Operator, now General Manager – BI & Data Governance, GeoServe. “Without automation or standardisation, operators find themselves in constant catch-up mode, trying to ensure that every stakeholder has the same version of the truth.”

The burden of manually collecting, cleaning, and formatting data doesn’t just slow teams down. It often becomes a blocker to efficiency further down the line. “90% of our processes

are completed manually,” Aayush Giri, Head of Freight at Moewe told us. “Cleaning the data is critical, but it’s a headache. If the data isn’t accurate when it reaches the operator, there’s a real risk that the person making the decision can’t use it, which delays everything.”

HIDDEN DATA

Manual processes also increase the chances of incorrect or delayed information being passed from ship to shore. One operator explained that if bunker levels are misreported, it could result in fuel being over-ordered, leading to costly overflows or excess inventory.

Without automated validation or cross-checks between systems, there’s limited visibility into whether the reported numbers are accurate. As a result, operators may be making key decisions based on faulty inputs, affecting voyage profitability, compliance, and risk management.

When data is trapped in isolated spreadsheets or arrives late, the cost isn’t just time, it’s misalignment, inefficiency, and missed commercial opportunities.

“Around 30-40% of the operators’ workload is mundane work, such as manual data entry and cleansing. That could be so easily avoided.”

Cyrus Mistry, Former Vessel Operator and now General Manager – BI & Data Governance, GeoServe.

FUNCTIONAL AND STRUCTURAL SILOS

Silos exist in every organisation. Functional silos emerge naturally as departments focus on their own priorities such as finance, operations, chartering, claims, each making decisions based on their domain expertise. On their own, silos aren’t necessarily a bad thing; they create accountability and focus.

But problems arise when these departments don’t coordinate or communicate their actions. Without shared context or consistent data, decisions are made in isolation. What seems efficient in one department may create costly knock-on effects in another.

Structural silos compound the issue. In some organisations, rigid hierarchies and outdated workflows discourage cross-department collaboration.² Teams operate within their own structures, rarely encouraged, or enabled, to share insights or align with one another.

Interdependency between departments is essential, especially when managing something as complex as a commercial voyage. Without cross-functional collaboration, information flow breaks down, mistakes multiply, and the overall profitability of a voyage is put at risk.

AN OVERRELIANCE ON EMAILS

Email remains the dominant form of communication for most voyage operators. It’s used to share voyage updates, exchange documents, and coordinate decisions between departments and with external partners.

While email offers flexibility, it also creates inefficiencies. Information is often buried in long threads, missed by key stakeholders, or delayed in reaching the right person. This leads to poor coordination, slower decisions, and duplicated efforts.



“Email is still the main form of communication between departments involved in the commercial aspect of a voyage. This not only slows down decision-making but also increases the risk of errors and misinterpretations, which is a major concern for voyage execution and commercial accuracy.”

Paolo Vaccaro, Head of Tanker Operations, d'Amico Group, Singapore.

Some tools like Sedna have made strides in organising email traffic and automating workflows, while Microsoft Teams, Slack, and even WhatsApp have created faster communication channels and are widely used in the maritime industry. But these tools often exist outside the core voyage systems. They offer speed, but not always context or traceability.

In the absence of a unified platform, email becomes the glue that holds fragmented systems together. But it's a fragile solution prone to overload, missed actions, and reduced transparency.

Email fills the gaps between disconnected tools, but it's a poor substitute for shared systems and structured collaboration.

THE CONSEQUENCES OF OUTDATED AND INCOMPLETE INFORMATION

Often, by the time information reaches decision makers, it is outdated, incomplete, or inconsistent. This has several consequences for the profitability of a voyage.

For example, the bunkering department might make decisions using a bunker price that's already a day out of date, unaware that prices have changed. Or the chartering team might confirm a fixture without real-time visibility into port congestion, leading to costly delays. The vessel performance department might only reconcile voyage performance weeks after completion, missing opportunities to improve the course of the voyage midway. Technical issues flagged onboard may not be communicated in time to impact voyage planning or risk assessment.

BUNKERING IS NOT JUST ABOUT PRICE

Bunker fuel is one of the largest cost components in any voyage, often accounting for more than 50%³ of total operating expenses. But focusing solely on the price per tonne can lead to costly mistakes.

An ideal platform should offer more than pricing data. Experienced procurement specialists have ears on the ground. They bring real-time insights and operational intelligence, including information on availability, port congestion, expected weather delays, and early warnings about off-spec fuel

batches. They know which suppliers or barges have a history of shortage claims or delayed deliveries, and which ports are facing tight supply conditions. An ideal platform should allow this information to be captured, collated, and shared with the operations and chartering teams, helping them make better, well-informed decisions.

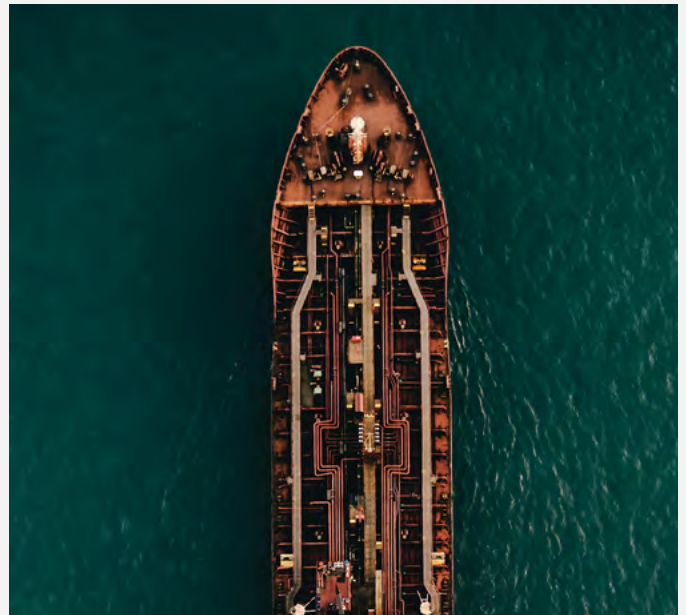
These details are critical, yet they rarely appear in bunker portals or static spreadsheets. If operators rely only on emailed price updates or incomplete information, they risk making decisions that compromise the voyage.

A port may look competitive based on price alone, but those savings can quickly disappear if delivery is delayed, the fuel is off-spec, or a dispute arises over quantity.

“When the chartering team is fixing a voyage from Port A to Port B, the operator’s job is to plan where we’ll pick up bunkers. If I don’t calculate that correctly and give the wrong feedback, they may fix a voyage expecting a certain amount of earnings, but it might end up delivering a lot less,” Rohit Khera, Former Vessel Operator and now General Manager of Port DA and Payment Solutions at GeoServe told us. “Voyages are often fixed with the expectation of earning \$5,000 a day in TCE, only to realise \$4,000 due to poor alignment in bunker planning.”

The nature of the bunker market today is shaped by unstable prices and limited market transparency. Price indications can shift rapidly due to changes in supply, geopolitics, weather, and operational constraints at specific ports. Many decisions are still based on static data, without factoring in current risk indicators or availability.

Getting it right requires access to accurate information overall, and in some cases, close coordination with procurement specialists. Without this, even the best-looking price can carry hidden operational and financial risks.



DISCONNECTED PLANNING: THE OPERATIONAL TOLL OF SEPARATING BUNKERING AND ROUTING

Traditionally, tramp operators plan voyages first and then separately determine where and when to refuel. This approach overlooks the fact that bunker fuel accounts for a major share of voyage operating costs, and that fuel prices vary significantly across ports and over time.

A 2014 study⁴ conducted by researchers from the Technical University of Denmark found that integrated planning led to more profitable outcomes. Across 150 scenarios, an integrated approach increased voyage profitability by up to 1.4% compared to the traditional approach.

The study also found that bunker price variations directly influenced routing decisions and cargo selection. In many instances, different cargoes were chosen or assigned to different ships based solely on changes in bunker pricing. The integrated model also reduced reliance on dedicated bunker stops by allowing planners to factor in bunkering opportunities during existing port calls.

The study is just one example that shows how siloed voyage planning leads to inefficiencies and missed opportunities.

LACK OF MOBILE-FRIENDLY TOOLS

Shipping operates around the clock, but many systems used in voyage operations are not optimised for mobile access. This creates a significant gap, especially for global teams working across time zones. Without mobile-friendly interfaces, operators are often unable to respond quickly unless they are at their desks.

“Shipping is a 24/7 business, but most systems aren’t mobile friendly. I’d get a call from my chartering guy in New York while I’m in Mumbai, and unless I opened my laptop and dug through systems, I couldn’t respond.”

Cyrus Mistry, Former Vessel Operator and now General Manager of BI and Data Governance, GeoServe.

When responsiveness depends on whether someone can access a desktop system, decisions are delayed, opportunities are missed, and costs can rise quickly. In today’s always-on operational environment, the lack of mobile access reduces agility.

ALERT FATIGUE

Operators need real-time notifications for events that impact voyage execution, such as weather, port delays, or inspection requirements. However, many systems either provide no alerts at all or too many, creating alert fatigue. One Voyage Manager told us, “I’ve seen

operators get 30-40 alerts per voyage, but only 5 of them apply to this particular voyage. The question they ask is ‘do I waste time checking all of them, or stop looking at them altogether.’” The overwhelming number of alerts can lead to users missing critical ones, and as a result, may get caught by avoidable disruptions.

To be effective, alerts must be timely, specific, and easy to act on. If not, they add to the workload instead of reducing it.

PORT BLIND SPOTS AND COSTLY DELAYS

Another challenge that arises due to outdated information and a lack of integration across departments is vessel detention and demurrage. For instance, a chartering team might secure a fixture that is financially attractive based on berth availability at a certain port. However, the team might be relying on outdated berth information. Upon the vessel’s arrival at the port, it encounters congestion, necessitating a waiting period before docking. The knock-on is a delayed voyage and the payment of demurrage from the charterer to the shipowner.

“Imagine you’re handling 10-15 vessels and juggling more than 10 applications. If you miss a single piece of information, you might miss your laycan, or worse, turn a profit-making voyage into a loss-making one.”

Rohit Khera, Former Vessel Operator and currently General Manager of Port DA & Payment Solutions at GeoServe.

"Visibility and timely information to avoid or mitigate those costs is critical. Disruptions, routing decision, port delays have a real financial impact," Paolo Vaccaro, Head of Tanker Operations at the d'Amico Group Singapore, told us.

Additionally, missed invoices can occur due to late detection of charter obligations. Without timely updates on key milestones such as vessel arrival, cargo operations, and port clearance, coordinating operations becomes difficult, leading to delays, demurrage, and detention costs.

THE CHALLENGE OF CLAIMS MANAGEMENT

Voyage claims are a major commercial risk. Yet today, performance data is still not consistently automated or integrated. This makes it difficult to analyse what went wrong, and when. In many cases, the root causes of delays, fuel overruns, or performance issues are discovered only after the voyage ends, when it's too late to take action.

Disputes often arise due to mismatches in fuel consumption data or unclear responsibilities. These situations lead to commercial losses, strained counterparty relationships, and time-consuming investigations.

Existing VMS are primarily built to track voyage P&L. But critical operational workflows such as emissions compliance, port disbursement approvals, or bunker claims are usually handled outside these systems. As a result, teams fall back on emails and spreadsheets to manage them. According to Dharm Parikh, Head of Strategy and Partnerships, GeoServe, "This means that some of the key voyage elements fall outside the VMS. Operators rely on spreadsheets and emails to manage these processes." Due to fragmented data sources, finance teams often receive incomplete voyage details weeks after completion. By then, any chance to investigate overruns or resolve claims proactively has already passed.

Rohit Khera, Former Voyage Manager and now General Manager of Port DA and Payment Solutions, GeoServe added, "If my real consumption is off from what I've

warranted, I need to know now, not six months later. That way, I can talk to my chartering team, my technical managers, and prepare for any potential claims."

When issues are spotted too late, corrective actions, such as speed changes or fuel re-optimisation, are no longer possible. This reactive approach limits accountability and erodes profit margins.

To manage claims effectively, teams need access to real-time performance data and clear audit trails across departments. Without it, operational blind spots persist and the cost of inaction compounds over time.

"Still dragging a bit in our industry is the inability to transfer proper performance information from the ship to shore without interaction."

Paolo Vaccaro, Head of Tanker Operations at the d'Amico Group, Singapore.



REGULATORY COMPLEXITIES

The regulatory landscape in shipping is evolving fast. New rules such as the Carbon Intensity Indicator (CII), FuelEU Maritime, and the EU Emissions Trading System (ETS) have introduced new layers of complexity to commercial voyage management.

Real-time compliance tracking is now essential. However, many VMS are not built to support these new demands. They struggle to keep up with the changing operational, regulatory, and commercial realities of shipping.

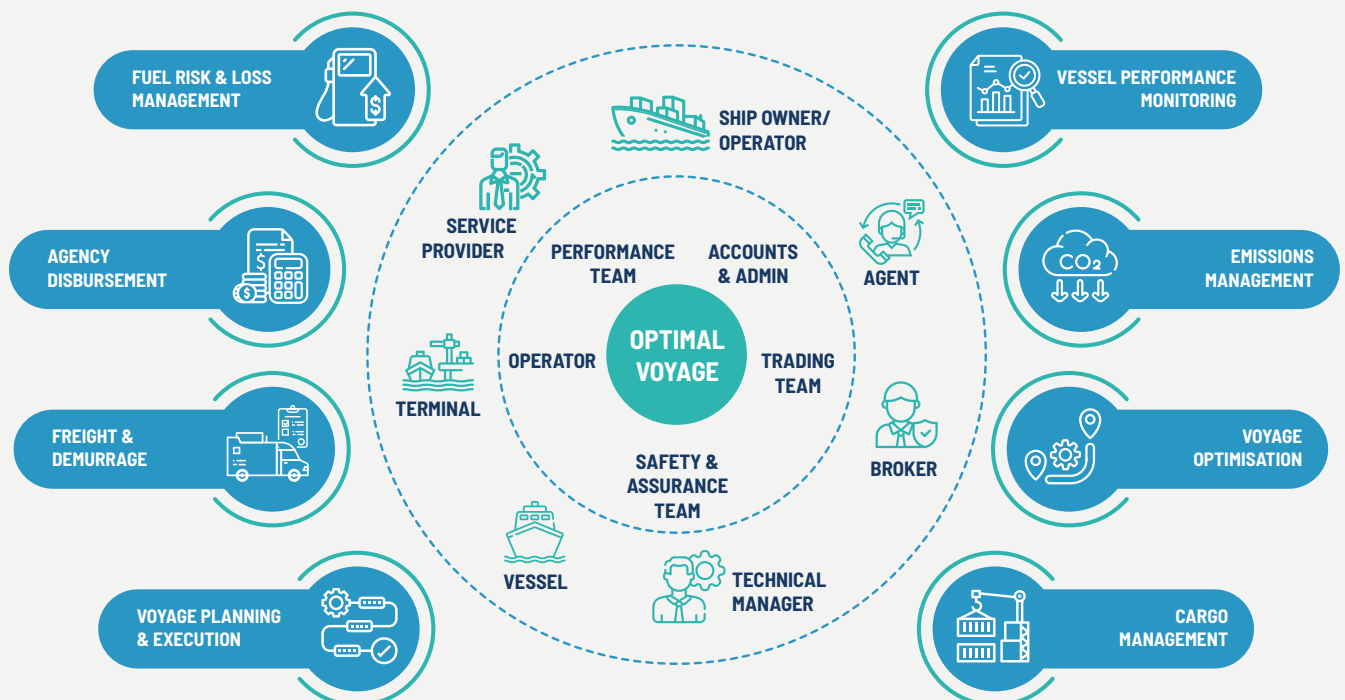
One key challenge lies in legacy system limitations. These systems often lack the flexibility to quickly adapt to evolving regulatory requirements such as EU ETS, FuelEU Maritime, or CII, particularly from a payables and receivables standpoint within the charter party context. As a result, managing emissions exposure, and counterparty settlements often remains a manual and error-prone process.

There is also fragmentation in user needs. Teams across chartering, operations, procurement, and risk all require different compliance insights. Most systems cannot cater to these varied requirements in a unified way.

Some regulations also require a longer-term view. For example, CII and FuelEU compliance is measured on an annual basis, not voyage by voyage. This means operators need systems that can track cumulative carbon exposure across the year. But just as importantly, these systems must support a receivables and payables approach to carbon, enabling companies to invoice and settle carbon costs accurately with their counterparties, voyage on voyage.

Many single, self-contained software models also exist. One Operations Manager told us, "Vendors attempt to be all things to all users, and end up doing few things well."

VOYAGE DILEMMA



While each of these challenges may seem minor in isolation, they can lead to an underutilisation of technology and inefficiencies in operations.

Over the course of a voyage or across a fleet, they add up to significant commercial risk.

ACHIEVING COMMERCIAL EXCELLENCE WITH A UNIFIED SYSTEM

Imagine being able to seamlessly integrate voyage planning, execution, port cost tracking, compliance, bunkering, and more into one easy-to-access view. In an industry where margins are tight and complexity is high, unifying these functions isn't a luxury, it's a necessary step.

This section explores why an integrated VOS should now be considered an essential component of commercial voyage management.

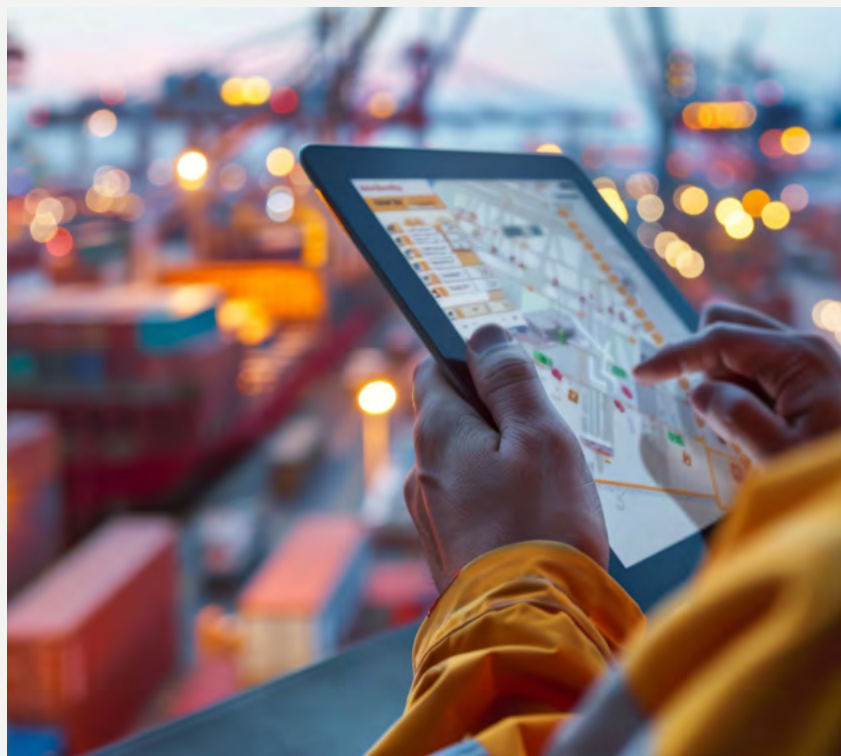
WHAT IS AN INTEGRATED VOYAGE OPERATIONS SUITE (VOS)?

A VOS is a digital workspace for managing voyage execution. It connects the core workflows of commercial shipping, including bunker procurement, port disbursement, laytime, vessel performance, emissions compliance, voyage optimisation, and analytics, in one integrated platform.

The goal is not to replace a VMS, but to make it work better. It's important to note that a VOS is not the same as a VMS. VMS platforms like IMOS and Dataloy are built primarily for finance, accounting, and voyage P&L, similar to how an Enterprise Resource Planning (ERP) system functions in business. In contrast, a VOS acts more like Office 365 for commercial operations. It's a unified workspace that boosts day-to-day productivity, increases visibility, and improves coordination across teams.

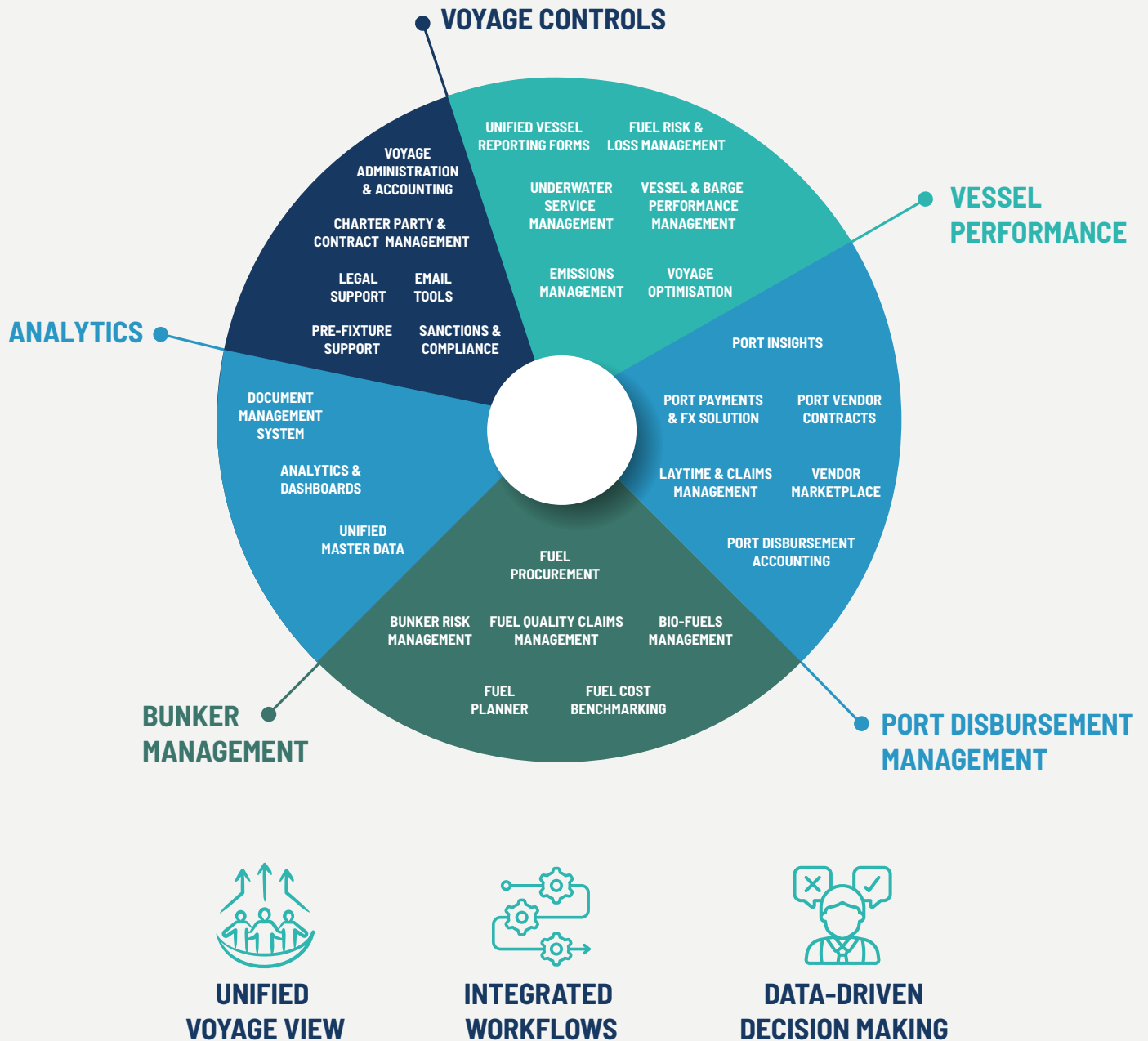
An integrated VOS brings together the tools and teams involved in voyage execution. It integrates workflows like bunker procurement,

port disbursement, vessel performance, laytime, compliance, and analytics, all in one connected platform. It helps standardise processes, reduce manual errors, and improve coordination between the different teams in operations. More importantly, it allows operators to work with live information and make timely, informed decisions. A good VOS becomes the operator's super app. It's a single workspace that connects commercial, operational, and compliance tasks, while simplifying execution and enabling faster decisions. It is designed to be mobile-friendly, allowing operators to access critical information and take time-sensitive actions without needing to open a laptop.



THE INTEGRATED PLATFORM

The aim of a VOS is to deliver an end-to-end approach to commercial voyage management by integrating workflows across pre-fixtured planning, post-fixtured execution, and post-voyage analysis.



THE BUSINESS CASE FOR AN INTEGRATED VOS

An integrated VOS drives competitive advantage in many ways. Largely, by centralising data and enabling real-time workflows across different functions in

the operations department. The following explores how a unified approach through a VOS enables shipping companies to gain deeper insights, automate critical processes, and enhance decision-making.

| Component | How a VOS enables competitive advantage |
|--------------------------------------|---|
| Provides a single source of truth | Everyone from the vessel operator to the CFO works from the same up-to-date dataset. This means no more conflicting reports to make decisions from and no more duplicated efforts. |
| Delivers real-time insights | Live data on vessel performance, fuel consumption, weather, bunker prices and more is provided, enabling data-driven and cost-efficient decisions to be made. |
| Automates data flows | Unifies master data for better data governance and compliance. Data is transferred automatically between modules in the platform, eliminating the need for manual transfer across spreadsheets. This reduces the risk of human error and removes the administrative burden on users to enter the same information multiple times. |
| Facilitates better scenario planning | Integrated data allows for better forecasting and what-if scenarios. For example, when bunker planning is done in isolation, without access to real-time weather, vessel performance data, or routing constraints, it can lead to higher cost, delays, and reduced efficiency. |
| Improves collaboration | By providing a single platform that all teams (including operations, performance, bunker procurement, finance, chartering, and claims, for example) can access, the risk of delays, miscommunication, or decisions based on incomplete or inaccurate data is reduced. |

Table 1. Key benefits of an integrated VOS. The suite facilitates competitive advantage by centralising data and enabling real-time integration across departments involved in the commercial management of a voyage.

EXAMPLES FROM OUTSIDE THE MARITIME INDUSTRY

Fragmented and siloed departmental tools are still commonly used in the commercial voyage management space, with different systems handling bunker procurement, vessel performance, and voyage monitoring. However, examples from other industries can help demonstrate the business benefits of adopting integrated platforms like Google Workspace or Microsoft 365.

In a study conducted by Forrester,⁵ a composite organisation that implemented Google Workspace reported employees saving an average of

1.5 hours per week through faster document collaboration, reduced email volumes, and improved scheduling. Similarly, Forrester’s study on organisations that implemented Microsoft 365 E3⁶ found that users saved an average of 1.9 hours per week by using integrated such as Teams, SharePoint, and OneDrive to streamline communication and collaboration.

In addition, a global financial services company that adopted Google Workspace to unify its workflows achieved a 20% increase in employee productivity, along with significant savings in IT maintenance and infrastructure costs over a three-year period.

5 Forrester (Jan, 2024) [The total economic impact of Google workspace](#)
6 Forrester (Jan, 2025) [The total economic impact of Microsoft 365](#)

SCALABLE AUTOMATION THROUGH PROPER DATA ORCHESTRATION

Many companies attempt to automate processes without first building a solid foundation. This is like trying to build a house without setting the base structure. In theory, it works. The lights and appliances may function for a while. But without a strong foundation, there is always a risk of collapse.

The same happens in voyage operations. Companies that try to automate fragmented workflows only make the underlying problems worse. Instead of improving efficiency, they create more siloed data, duplicate work, and lose visibility into key operational decisions.

To achieve real efficiency and scalability, businesses must first get their enterprise data orchestration right. Only then can automation deliver on its promise of streamlined, intelligent, and cost-effective operations.

An integrated VOS provides this foundation. It consolidates information from voyage planning, port operations, compliance, and vessel performance into a single, connected system. Operators no longer need to manually input data into different tools, send updates over email, or reconcile spreadsheets. Information flows automatically to the right teams in real time, reducing errors, delays, and confusion.

When processes are standardised and data is shared across departments, operational workflows become more coordinated. This is the first real step towards practical automation.

With a VOS in place, common operational problems can be avoided:

- ▶ **Port Disbursement Account (DA) processing** – Updated arrival times during a voyage are often not reflected across systems. As a result, DA processing teams may continue to rely on outdated schedules. This can cause delays in payment approvals, missed rebills, and difficulty recovering costs from charterers or agents when voyage instructions change.
- ▶ **Laytime management** – Changes to a vessel's ETA can directly affect the timing of its arrival at port. If these changes are not shared across the teams, vessels may arrive outside the laycan window or too early, where early loading might not be covered under the charter party terms. This can lead to disputes and inaccurate laytime assessments, directly impacting commercial outcomes.

A VOS connects these updates directly to the teams that need them. It reduces the risk of errors and ensures that operations, compliance, and commercial functions stay aligned with real-time information, not outdated assumptions.

If you have around five vessels, the repetitive manual workload might be tedious but manageable. But when you scale to 50 vessels, this approach becomes too chaotic to manage well. A VOS is more than a tool. It's an entire ecosystem that enables a company to scale without burning out its human resources.

As an organisation expands, the need for flexible, connected workflows becomes even more critical. A VOS provides that flexibility. It allows companies to scale operations, adapt to new regulatory demands, and add new services without disrupting day-to-day execution.

For smaller operators, a VOS offers a real advantage. It gives lean teams the same operational clarity and efficiency as larger organisations, levelling the playing field.

Enabling human-in-the-loop

It is important to note that an integrated VOS should be able to deliver human-in-the-loop workflows and not just automate blindly. Human-in-the-loop refers to a hybrid approach where automated systems and human judgment are integrated into a single workflow.⁷

This is necessary for several reasons, including reducing the risk factor, ensuring automated processes remain compliant with regulatory requirements,⁸ enabling continuous improvement, and getting insight into which processes can be automated and which cannot. The humans in the loop perspective also acknowledges that some processes simply can't be automated.

Wallem Group is just one shipping company that has emphasised the importance of the human-in-the-loop approach to enable digital transformation. Business Development & Marketing Director, Luis Benito said last year that keeping the human in the loop is critical to create business value and improve life at sea in shipping's collaborative digital future.⁹

Across voyage operations, human expertise remains essential. For instance:

- ▶ **Master Mariners and Meteorologists** work together to interpret weather routing advice, ensuring that operational decisions balance speed, safety, and fuel efficiency.

- ▶ **Naval Architects and Marine Engineers** analyse outputs from digital twins to assess hull degradation and recommend timely maintenance actions.
- ▶ **Port Disbursement Specialists** review port costs and agency invoices to catch anomalies that automated systems may miss.
- ▶ **Bunker Purchasers** monitor real-time pricing but also rely on their network intelligence to spot supply disruptions, quality issues, or hidden risks that are not visible through pricing portals alone.

A VOS should balance the automation of routine tasks while keeping critical decisions visible, reviewable, and guided by expert human judgment.

Providing structured inputs to AI & ML models

Artificial Intelligence (AI) and Machine Learning (ML) models are increasingly being applied in shipping operations to optimise decisions across areas like bunker procurement, weather routing, and charter party compliance. These models can identify patterns, forecast outcomes, and automate complex tasks.

However, AI and ML are only as good as the data they receive. Without clean, structured, and consistent data, even the best algorithms will deliver poor results.¹⁰

An integrated VOS helps address this challenge. The suite organises and standardises operational data, ensuring that

⁷ Camunda (Jun, 2024) [What is human in the loop automation](#)

⁸ SME News (May, 2024) [The importance of human oversight in automated processes](#)

⁹ Wallem (Oct, 2024) [Wallem enables digital transformation in shipping with humans in the loop](#)

¹⁰ NCS (Oct, 2024) [Everything AI in the maritime industry](#)



inputs feeding AI and ML models are accurate, validated, and ready for deeper analysis.

For example:

- ▶ **Claim Automation** – A VOS structures key voyage documents such as Statements of Facts (SOFs), charter party terms, voyage orders, and cargo papers. This enables AI models not only to automate laytime calculations but also to analyse interim port calls and automatically trigger rebilling processes where applicable.
- ▶ **Bunker Risk Prediction** – By consolidating bunker quality batch data, barge movement tracking, and supplier performance history, a VOS provides structured inputs that allow AI models to better predict risks related to fuel quality, shortages, and delivery reliability.

- ▶ **Compliance Automation** – Structured voyage and counterparty data enable AI models to continuously scan counterparties, invoicing parties, and entities involved in the voyage chain, including during STS (Ship-to-Ship) transfers, to proactively flag sanctions risks and compliance breaches.

By getting the data orchestration right first through a VOS, the use of AI and ML for decision support becomes far more powerful. It reduces the time and effort teams would otherwise spend manually cleaning, verifying, and consolidating information.

The result is smarter decision-making, faster scenario planning, and a real shift from reactive to proactive voyage management.

THE POWER OF THE COMMERCIAL CONTROL TOWER (CCT)

One of the most powerful benefits of a modern, integrated VOS for commercial voyage management is that it enables the Commercial Control Tower (CCT) concept.

The CCT is fundamental for providing visibility into operations that is essential for making decisions that make commercial sense. The CCT is inspired by the wider supply chain control tower. This is an integrated IT system that gathers real-time data from across all functional areas of the supply chain, aggregates it in a central hub, and enables greater control over processes spread across departments.¹¹

Think of it as the nerve centre of voyage operations. While the VOS system brings together the workflows, the CCT consolidates the data and provides a real-time, centralised view¹² of the voyage's commercial activities through a dashboard. It draws on data from the VMS and VOS' modules spanning chartering, operations, finance, procurement, and compliance, and presents this information in an interface designed to support commercial oversight and decision making.

¹¹ Altexsoft (Apr, 2023) [Supply chain control tower: enhancing visibility and resilience](#)

¹² IBM (Jul, 2021) [What is a supply chain control tower?](#)

“Transparency in shipping is not easy. Integrating multiple voyage management processes and displaying them through a centralised system like a Commercial Control Tower could be very useful for minimising human error.”

Faisal Assaf, Marine Consultant and Ship Manager.

One example of a control tower being used in the maritime supply chain is a company that implemented the capability to manage quay planning and vessel monitoring.¹³ The tool schedules both sea vessels and barges, linking seaport and hinterland terminal operations to provide end-to-end supply chain visibility. The control tower tracks vessel movements and displays their statuses on a centralised dashboard. It also provides real-time insights into terminal and quay operations, enabling stakeholders to assess current statuses and adherence with agreed plans. Real-time monitoring ensures that any deviations are promptly identified and communicated to users.

The true value of a CCT lies not just in making individual processes more efficient, but in orchestrating how these processes interact. Instead of fragmented, department-specific actions, decision-making becomes connected across the organisation. A CCT helps turn scattered operational insights into an integrated, enterprise-wide view.

How a CCT can turn a good bunkering decision into a great one

When it comes to bunkering, the decision is about more than where to get fuel. It involves which fuel to choose, at what price, how much to lift, and when to do it. Optimising these decisions is crucial, as bunkering is one of the largest expenses of a voyage's total costs, often accounting for 50-75% for a container ship.¹⁴ This is even more critical for tramp vessels operating under voyage charters, where owners must constantly balance the trade-offs between local fuel prices, deviations from the shortest route, and the time spent at potential bunkering ports.¹⁵

Bunkering decisions have a direct impact on a voyage's P&L, and it is important for a system to assess and provide real-time updates that can positively influence the financial health of the voyage.¹⁶

A CCT becomes an essential part of an integrated VOS in this context. It goes beyond simply finding the cheapest bunker price. It provides the operational, commercial, and compliance data needed to make smarter decisions that maximise the overall commercial success of a voyage.

By consolidating live voyage data, a CCT provides real-time insight into:

- ▶ Bunker prices at various ports.
- ▶ Bunker swaps and hedging options.
- ▶ Updated vessel schedules and ETAs.
- ▶ Fuel consumption forecasts based on routing and weather.
- ▶ Available fuel capacity and past consumption patterns.
- ▶ Supplier performance and delivery reliability.
- ▶ Emissions exposure linked to different bunkering options.

¹³ Teqplay (accessed Apr, 2025) [Control tower for the maritime supply chain](#)

¹⁴ Medina, J R et al., (Oct, 2020) [Bunker consumption of containerships considering sailing speed and wind conditions](#)

¹⁵ Fuentes, G et al., (Jun, 2024) [The effects of waiting times on the bunkering decision for tramp ships](#)

¹⁶ ClearVoyage (Oct, 2024) [Understanding voyage P&L](#)



The CCT connects bunkering decisions directly to voyage profitability forecasts. It allows managers to see the broader impact of their choices, not just in terms of bunker price, but in how those decisions affect the overall voyage margin, emissions compliance, and commercial risk.

For example, if a lower-cost port is available but would delay the voyage by 12 hours, the CCT can model whether the potential fuel savings outweigh the lost revenue from delay. Instead of making decisions based on price alone, voyage managers can make choices that are aligned with full voyage profitability and risk exposure.

CCT, bunkering, and regulation

Environmental regulations like the EU ETS, CII, and FuelEU have added new layers to the bunkering equation.

The EU ETS introduces a direct carbon cost through the need to purchase emissions allowances, while CII and FuelEU impose operational performance requirements that influence fuel choices, routing, and voyage execution strategies.

Operators now must factor in carbon costs and compliance exposure alongside traditional fuel price and logistics considerations.

Bunkering is no longer just about the dollar per tonne. Fuel decisions now impact voyage earnings, contractual obligations, and compliance standings. Routing decisions may need adjustment to minimise time spent in EU-regulated zones, or to select alternative ports that reduce EU ETS exposure.

Calculating the true cost of bunkering today requires integrating multiple variables, including:

- ▶ Local bunker prices
- ▶ Real-time vessel consumption data
- ▶ Distance and time within carbon-regulated zones
- ▶ Carbon price exposure based on EU ETS allowances
- ▶ Impact on annual CII ratings and FuelEU targets

Siloed systems cannot handle this complexity. Operators need an integrated view that links operational planning with commercial and regulatory obligations.

A CCT, powered by an integrated VOS, provides this capability. It can:

- ▶ Calculate emissions costs for each bunkering scenario by assessing EU ETS exposure.
- ▶ Model the impact of different fuel grades and ports on CII and FuelEU compliance.
- ▶ Integrate updated routing, berth availability, and weather data to optimise both cost and compliance outcomes.
- ▶ Consolidate accurate operational data for mandatory reporting under EU MRV and IMO DCS schemes.

By enabling operators to see the commercial, operational, and regulatory impact of each bunkering decision in real time, a CCT shifts compliance management from reactive to proactive, and ensures better overall voyage performance.

EXECUTIVE PERSPECTIVES: INSIGHTS ACROSS THE C-SUITE

|  HEAD OF OPERATIONS |  OPERATIONS MANAGER |  CHARTERING MANAGER |
|---|--|---|
| <p>Priority: Cost visibility and strategic planning</p> <p>Challenges:</p> <ul style="list-style-type: none"> Fragmented financial data across fleets and departments Delayed reporting on voyage costs Difficulty in forecasting and modelling strategic decisions <p>Integrated VOS Uses:</p> <ul style="list-style-type: none"> Accessing real-time cost data across the fleet and departments Generating executive dashboards Reviewing performance KPIs and financial forecasts <p>Key Benefits:</p> <ul style="list-style-type: none"> End-to-end cost transparency Strategic oversight Better investment planning | <p>Priority: Efficiency and speed of voyage turnaround</p> <p>Challenges:</p> <ul style="list-style-type: none"> Timely escalation of issues from the operator Manual updates received from port agents and masters Communication delays between teams and departments Repetitive data entry <p>Integrated VOS Uses:</p> <ul style="list-style-type: none"> Offering management-by-exception alerts that escalate critical deviations Real-time port activity tracking and faster coordination for vessel turnaround in port Automated task checklists <p>Key Benefits:</p> <ul style="list-style-type: none"> Faster voyage execution Less manual work Improved collaboration | <p>Priority: Voyage profitability insights</p> <p>Challenges:</p> <ul style="list-style-type: none"> Disconnected chartering and ops data Inaccurate post-voyage P&L Lack of visibility into fuel and port costs <p>Integrated VOS Uses:</p> <ul style="list-style-type: none"> Drill-down viewing on actual on actual vs estimated voyage profitability Monitoring impact of bunker and port expenses Analysing chartering performance over time <p>Key Benefits:</p> <ul style="list-style-type: none"> Sharper commercial decisions Real-time profitability tracking Better chartering strategies |

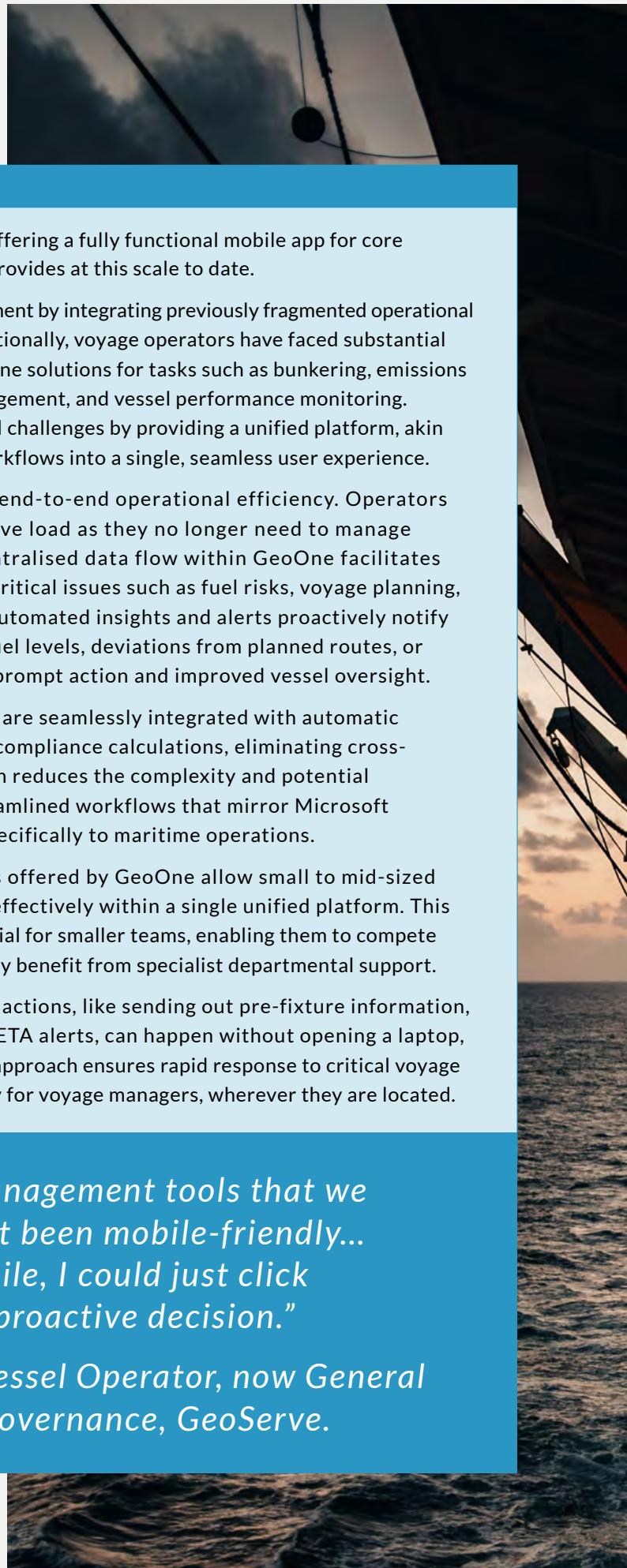
FUTUREPROOFING YOUR FLEET WITH AN INTEGRATED VOS

A major benefit of an integrated VOS is its ability to evolve with the business. One growing demand is for instant, mobile access to information, wherever and whenever it's needed. This is especially critical in global teams, where, for example, one person is based in the UK/Europe and the other in Asia/Middle East. With such

a time difference, proactive decision-making is already a challenge. If key information can only be accessed via a laptop, rather than a quick glance at a phone, that challenge becomes even greater.

Decision makers no longer want to sit at a computer to view voyage plans or make bunker bookings. "A mobile-friendly VOS system is necessary for operators to perform critical tasks like sending our pre-fixture information,

booking bunkers or appointing agents through a mobile app,” a Senior Voyage Manager told us. A modern integrated VOS that embraces a 'super app' approach is necessary to meet the demand for always available information.



GeoOne: Unifying Voyage Management

GeoOne is the first-of-its-kind in maritime, offering a fully functional mobile app for core operations, something no existing platform provides at this scale to date.

GeoOne is changing maritime voyage management by integrating previously fragmented operational tools into a cohesive digital ecosystem. Traditionally, voyage operators have faced substantial inefficiencies from juggling multiple standalone solutions for tasks such as bunkering, emissions compliance, port disbursements, agent management, and vessel performance monitoring. GeoOne directly addresses these operational challenges by providing a unified platform, akin to how Microsoft 365 centralises diverse workflows into a single, seamless user experience.

GeoOne's core strength lies in delivering end-to-end operational efficiency. Operators benefit significantly from reduced cognitive load as they no longer need to manage multiple tools and manual handovers. Centralised data flow within GeoOne facilitates faster, more informed decision-making on critical issues such as fuel risks, voyage planning, and performance management. Real-time automated insights and alerts proactively notify operators of essential events such as low fuel levels, deviations from planned routes, or unusually high fuel consumption, enabling prompt action and improved vessel oversight.

In addition, tasks such as bunkering at port are seamlessly integrated with automatic agent appointments and instant emissions compliance calculations, eliminating cross-platform manual processes. This integration reduces the complexity and potential for human error significantly, creating streamlined workflows that mirror Microsoft 365's productivity benefits, but tailored specifically to maritime operations.

Scalability and productivity enhancements offered by GeoOne allow small to mid-sized operators to manage fleets of 25-30 ships effectively within a single unified platform. This increased productivity is particularly beneficial for smaller teams, enabling them to compete effectively with larger operators that typically benefit from specialist departmental support.

Moreover, GeoOne ensures voyage-critical actions, like sending out pre-fixture information, approving port payments or responding to ETA alerts, can happen without opening a laptop, improving responsiveness. This mobile-first approach ensures rapid response to critical voyage actions, operational continuity, and flexibility for voyage managers, wherever they are located.

“Most of the voyage management tools that we have been using haven't been mobile-friendly... If I had that on my mobile, I could just click a button... and make a proactive decision.”

Cyrus Mistry, Former Vessel Operator, now General Manager – BI & Data Governance, GeoServe.

A modern integrated VOS also future-proofs decision-making by integrating AI-driven insights on flexible tech architecture and a robust data warehouse. Instead of relying on siloed data, operators gain predictive analytics, such as accurate port congestion forecasts or optimal voyage routing that balances fuel costs with emissions compliance (such as EU ETS). This shifts operations from reactive to proactive, enhancing both efficiency and regulatory compliance.

Additionally, the VOS' plug-and-play API architecture eliminates integration friction. It enables seamless connectivity with both existing and emerging tools, ensuring the system evolves with industry needs without costly overhauls. This adaptability cements the VOS as a long-term operational hub.

PROFITABILITY, RISK REDUCTION, AND GROWTH

By integrating voyage operations with commercial planning and financial control, a VOS allows mid voyage decision-making that is informed, agile, and profit-focused. A VOS doesn't just track what's happening, it helps you decide what should happen.

The importance of mid-voyage corrections

Mid-voyage corrections are critical for profitability, risk reduction, and sustainable growth. A modern VOS that brings together real-time insight on voyage performance, P&L, and KPIs shows exactly how an event or decision in

one department will affect another. This enables a more complete operational picture and tighter cost control throughout the voyage lifecycle.

For example, a voyage may begin to experience an eroding P&L due to heavy weather or other unforeseen costs like a spike in bunker prices. These increased costs or necessary change to a voyage schedule may impact the terms of the charter party. However, an integrated VOS will flag it through live analytics, allowing operators to enact mid-voyage corrections, such as rerouting or making changes to the speed, to mitigate the issue.

Real-time KPI integration acts as an early-warning system so that cost overruns or performance drops are detected and responded to immediately, rather than at a later point. By integrating this information into an accessible, single, unified platform, operations teams can see live profit calculations while finance can see fuel usage and charter party compliance, and both can coordinate if an adjustment is needed mid-voyage.

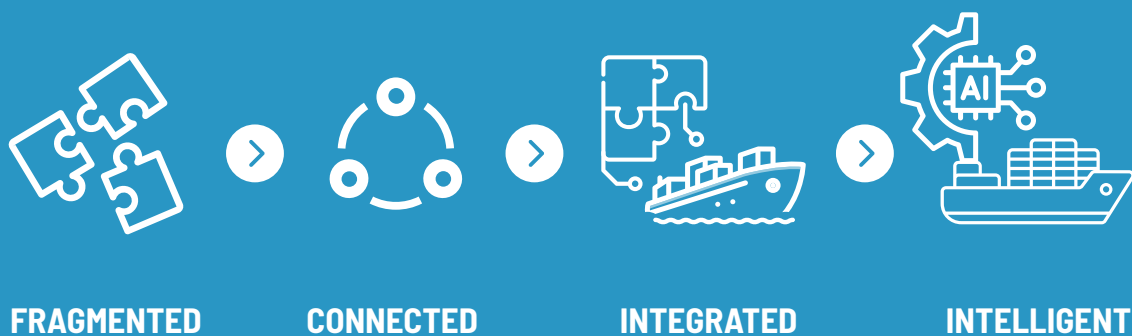
This means everyone from the Operations Manager to the Chartering Manager is working off the same up-to-date voyage picture, empowering teams to act as one unit to achieve the safest, most profitable outcome. Mid-voyage decisions are no longer isolated or reactive. Instead, they are collaborative, data-driven, and aligned to the overall commercial objective.

With an integrated VOS, charterers can set commercial targets that operations then execute against in real time, while financial teams monitor the voyage P&L impact live. This integration enables mid-voyage tweaks to satisfy all stakeholders, something not feasible when each department works in isolation.



MAKING INTEGRATED VOYAGE OPERATIONS REAL: A PRACTICAL ROADMAP FOR VESSEL OPERATORS

Implementing an integrated VOS may be complex, but manageable with the right steps. Success lies not just in selecting the right software, but in partnering with a vendor who understands the operator's language, coupled with strong internal planning, stakeholder buy-in, and disciplined change management. The following frames the transition to an integrated VOS through a maturity model, exploring how companies can move from fragmented to integrated to intelligent operations.



STAGE 1: IDENTIFY FRAGMENTED OPERATIONS

The first step in moving away from fragmented operations is understanding where the main pain points lie and how they impact operational performance.

During this research, several common fragmentation patterns across voyage execution teams were identified.

FRAGMENTATION IN ACTION

Disconnected systems & manual data entry

Fragmentation → Voyage teams juggle at least 7-10 disconnected systems across bunker procurement, vessel performance monitoring, weather routing, emissions compliance, port disbursement, laytime tracking, and invoice settlement. These critical workflows rarely share data automatically.

Frustration → Bunker procurement teams operate through one platform, vessel performance and fuel optimisation through another, emissions and decarbonisation teams rely on a third, and port DA and laytime tracking use yet another system. Operators must constantly switch between portals, re-enter the same voyage updates, and manually reconcile data between teams.

Inefficiency → Manual data input across systems slows down workflows and increases the risk of error. Different departments work off isolated information, resulting in missed savings, delayed cost recovery, and poor commercial alignment across voyages.

Hidden data

Fragmentation → Voyage-critical information, such as bunker pricing, port congestion updates, vessel speed and consumption data, or emissions exposure, is often spread across spreadsheets, siloed web portals, and internal emails. Real-time visibility is limited.

Frustration → Operators and chartering support teams rely on outdated or incomplete data when making time-sensitive decisions, such as selecting bunkering ports or rerouting voyages.

Inefficiency → Voyages expected to deliver \$5,000/day in earnings can end up at \$4,000/day due to inaccurate bunker assumptions, unforeseen port delays, or poor consumption forecasts. These are issues that could have been avoided with integrated data visibility.

Reliance on emails and a lack of mobile access

Fragmentation → Despite operating in a 24/7 environment, voyage execution still relies heavily on emails for communication and updates. Most operational systems are not optimised for mobile access.

Frustration → Critical voyage updates are often delayed. Operators working across time zones must frequently check laptops after hours instead of accessing urgent information quickly through mobile devices.



Inefficiency → Time-sensitive actions like confirming bunkers, issuing port instructions, or approving rebills get delayed, leading to commercial exposure and operational inefficiencies.

Alert fatigue

Fragmentation → Operators are flooded with dozens of alerts per voyage, many of which are irrelevant due to poor filtering and targeting.

Frustration → Important operational risks, such as weather disruptions or draft restrictions, get lost in a sea of non-critical system messages.

Inefficiency → Missed alerts result in last-minute surprises, rushed decisions, missed laycan windows, and preventable costs like demurrage, detention, or off-hire.

next step is to determine the business goals and how fragmentation can be reduced with integration to achieve these.

STAGE 2: TRANSITION TO INTEGRATED OPERATIONS

After fragmented workflows are identified, the next step is to move toward greater connectivity and integration.

However, it is important to understand that "connected" and "integrated" operations are not the same, and many companies today find themselves stuck halfway.

CONNECTED OPERATIONS: THE FIRST STEP

In the connected operations stage, companies link core workflows together, often by connecting various tools back to a central VMS. Rather than installing lots of new systems, more consideration is given to the interactions and interplay between processes, people, and systems.¹⁷



Examples include:

- ▶ Linking port disbursement data into the VMS.

- ▶ Connecting bunker procurement stems (price and quantity) into the VMS.
- ▶ Updating validated noon report data into the VMS.

While this improves workflow efficiency, it still leaves data silos in place. For example, master data such as vessels, ports, counterparties, and bunker vendors is often maintained separately across different systems. Departments may continue to work off different versions of the same voyage depending on which platform they reference. Operators often have to manually reconcile information across emails, spreadsheets, and dashboards.

Connected operations solve for basic interoperability, but they do not create a truly unified operational environment.

| CONNECTED vs INTEGRATED Operations | |
|--|---|
|  CONNECTED Operations |  INTEGRATED Operations |
| Workflows may be connected to a VMS or each other through Application Programming Interfaces (APIs). | Workflows and teams operate inside a unified suite and data structure. |
| Master data (vessels, ports, bunker vendors) is still managed separately across tools. | Master data is consolidated. All tools pull from the same base datasets. |
| Data flow exists but real-time context or a "single source of truth" is missing. | True real-time visibility, shared commercial context across departments. |
| Operators still depend heavily on reconciling data outside systems (spreadsheets, emails). | Minimal reconciliation required – system drives consistent reporting and decision-making. |
| Normally seen in larger companies where departments remain fragmented. | Seen in companies building next-generation voyage operations platforms. |

INTEGRATED OPERATIONS: BUILDING A UNIFIED FOUNDATION

True integration goes a step further.

In integrated operations, workflows are not just connected; they are managed within a unified suite, using a single, consistent data structure.

Chartering teams, vessel operators, performance and fuel optimisation specialists, bunker specialists, and port cost controllers all work off the same master data, the same voyage milestones, and the same real-time commercial picture.

An integrated VOS ensures:

- ▶ Consistent vessel and port master data across all modules.

17 Thetius (May, 2024) [Charting a profitable course](#)



- ▶ Real-time updates of voyage events reflected across bunkering, port DA, emissions tracking, and laytime claims.
- ▶ A single operational view of voyage profitability, emissions exposure, and port performance.

Integration eliminates duplication of work, reduces reconciliation overhead, and enables teams to act faster and more confidently based on shared insights.

WHY THE DISTINCTION MATTERS

Many larger operators believe they are integrated when they are merely connected. True integration moves beyond technical data transfers for a handful of use cases; it enables real-time, commercially aligned decision making across all voyage workflows.

Without full integration:

- ▶ Costs are hidden across systems. For example, bunker over consumption or unexpected port costs are not visible until after voyage completion.

- ▶ Compliance risks grow. For instance, carbon reporting under EU ETS is delayed because emissions data is manually extracted from different systems.
- ▶ Opportunities for margin improvement are missed. For example, better bunkering or routing options are overlooked because voyage performance data is scattered.

Integrated operations are not just a technical upgrade, they are a business transformation that strengthens commercial resilience and operational excellence.

HOW TO MOVE FROM FRAGMENTED TO INTEGRATED OPERATIONS

The transition to fully integrated operations typically happens in two stages:

1. Moving from fragmented to connected operations

The first step is to connect core voyage workflows. This involves reviewing all current processes, mapping critical data flows,¹⁸ and setting up APIs to enable smooth communication between key systems.¹⁹ Connected operations improve visibility and reduce basic inefficiencies but master data is often still scattered, and cross-department collaboration remains limited.

At this stage, companies gain initial operational improvements but still face challenges with data duplication, manual reconciliation, and fragmented reporting.

2. Moving from connected to integrated operations

The second step is to consolidate workflows into a unified operational environment.

Here, operators shift from simply linking systems to fully aligning processes, people, and data onto a single platform. A true

¹⁸ The CFO Club (Jan, 2025) [How to improve operational efficiency: 9 steps for simpler ops](#)

¹⁹ Riviera (Jun, 2024) [The role of API integration in shipping](#)

VOS integrates bunker procurement, port disbursement, laytime management, emissions compliance, and voyage performance management into one ecosystem built on a single source of truth.

Moving from connected to integrated operations is what unlocks real-time, commercially aligned decision making.

KEY CONSIDERATIONS AT EACH STAGE

CHALLENGES AT THE CONNECTED STAGE

While connecting workflows improves efficiency, it creates a growing burden on IT teams:

- ▶ Managing APIs across multiple standalone systems becomes time-consuming and prone to error.
- ▶ Each new tool adds integration and maintenance overhead.
- ▶ Data inconsistencies persist across platforms, forcing manual reconciliations.
- ▶ Vendor lock-in and system compatibility issues can create operational bottlenecks.

One of the challenges at this stage is that companies find themselves constantly reacting to patching workflows, managing daily exceptions, onboarding new assets, or dealing with legacy system handovers. According to a 2023 research paper, this approach causes organisations to spend significant time managing the very systems that enabled integration and making it difficult to shift their attention towards intelligent, predictive, and proactive operations.²⁰

CHALLENGES AT THE INTEGRATED STAGE

Even at the integrated stage, there are important challenges to manage:

- ▶ Change management is critical, as operators must shift to working inside a unified suite rather than relying on old processes.
- ▶ Governance becomes vital to maintain data quality and standardisation across departments.
- ▶ System adaptability must be maintained to ensure the platform evolves with regulatory changes, voyage strategies, and market conditions.

Without strong ownership and process alignment, even integrated platforms can drift back toward fragmentation over time.



ALTERNATIVE PATH: COMMERCIAL VOYAGE MANAGEMENT AS A SERVICE (CVMAAS)

For some companies, fully building an integrated operations framework internally can be time-consuming and resource-heavy.

Commercial Voyage Management as a Service (CVMAAS)²¹ offers an alternative: a bundled solution that brings together skilled voyage management personnel, established best-practice workflows, and an integrated technology platform.

This model removes the need to recruit in-house talent, build complex internal systems, or manage multiple vendor subscriptions allowing companies to focus directly on commercial growth and operational outcomes.

It is important to keep in mind that integration is a stopgap and the journey to intelligent operations should continue.

STAGE 3: MOVING TOWARDS INTELLIGENT OPERATIONS

Once workflows, people, and data are truly unified under an integrated platform, the next step is to move towards intelligent operations. However, achieving intelligence requires more than just technology upgrades or tools. It needs time, mindset shifts, and headroom for innovation.

INTELLIGENCE IN ACTION

Intelligent operations rely on advanced analytics, automation, and predictive insights to continuously optimise commercial performance. AI and ML drive decision-making through real-

time recommendations for routing, bunkering, emissions management, and claims handling.

Key elements of intelligent operations include:

- ▶ Cross-functional workflows – Tasks traditionally spread across multiple departments are unified. Example: Bunker booking automatically updates port call schedules and emissions tracking.
- ▶ Predictive alerts – Risks, delays, and deviations are flagged before they escalate. Example: Operators are alerted when weather or speed changes could impact TCE Variance by more than 5%.
- ▶ Scenario modelling – Helps teams proactively plan adjustments mid voyage. Example: Operators simulate alternative bunkering or routing options to optimise voyage profitability.
- ▶ Dynamic voyage re-forecasting – Voyage plans update automatically based on live market and operational data. Example: Port congestion data triggers proactive speed or route adjustments.
- ▶ Real-time KPI dashboards – Visibility into voyage performance, costs, and compliance status at any moment. Example: Operators track live TCE, emissions exposure, and port turnaround times without manual reporting.

Intelligent systems also continuously learn and improve without being told to do so, enhancing outcomes over time.²²

AN EXAMPLE OF AI-POWERED CLAIMS MANAGEMENT

An example of intelligent operations is automating the traditionally manual process of claims management, especially for laytime and demurrage.

In an integrated VOS, AI models predict and continuously forecast potential claims exposure by analysing:

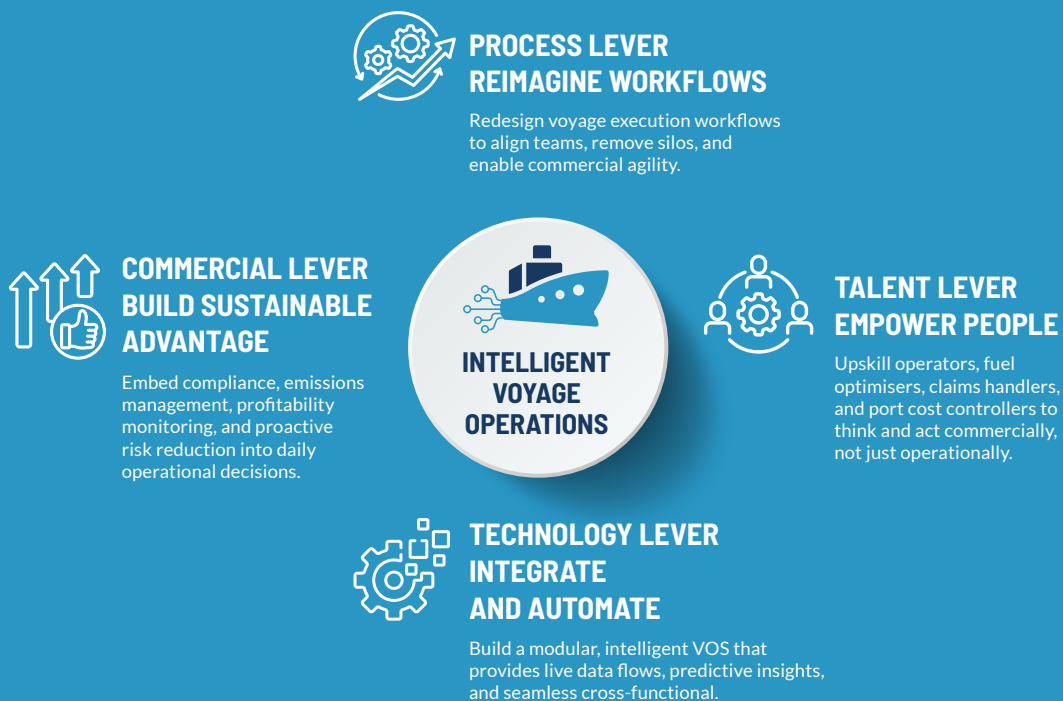
²¹ Thetius (May, 2024) [Charting a profitable course](#)

²² Science News Today (Mar, 2025) [AI and machine learning: the engines driving future innovation](#)

- ▶ Historical port turnaround times for similar vessel sizes.
- ▶ SOFs received from port agents regarding cargo operations.
- ▶ Cargo handling rates and laytime clauses extracted from charter party agreements.
- ▶ Real-time berth line up and port congestion data.

As the voyage progresses, the system automatically updates laytime calculations based on real-time events such as NOR tendering and cargo operations. Once the voyage ends, demurrage claims are automatically prepared, factoring berth waiting, loading rates, and allowable laytime under the CP terms.

UNLOCKING INTELLIGENT VOYAGE OPERATIONS: THE FOUR LEVERS



This approach speeds up claims preparation, reduces errors, and allows operators and commercial teams to act faster when defending or raising claims, without missing deadlines or overlooking recoverable costs.

HOW TO MOVE FROM INTEGRATED TO INTELLIGENT OPERATIONS

Reimagining the workflow

To successfully move to intelligent operations, the workflow must be reimagined. This means that when moving towards an intelligent VOS, it must be seen as a business transformation, not just another IT project.

An integrated VOS is a powerful first step but to unlock intelligence, operators must redesign how work is actually executed. The real challenge is finding the right balance between standardisation and flexibility, between efficiency and the practical realities of commercial shipping. Any system aiming to become "the platform" needs to drive clear operational gains without losing the adaptability and specialist knowledge that shipping teams demand and depend on every day.

Rohit Khara, Former Vessel Operator and now General Manager of Port DA and Payment Solutions at GeoServe, pointed out that it's easy to build a portal that simply links multiple systems together, but true transformation requires rethinking how work should flow across a voyage.

For instance, operators shouldn't have to manually cross-check bunker prices or emissions data, and real-time alerts and intelligent prompts should push critical insights proactively, not wait for manual pull. Furthermore, inputs once entered should automatically populate all necessary reporting formats, avoiding multiple manual entries. Ultimately, technology must fit operators' cognitive and task patterns, not the other way around.

Proactive decision-making, which includes spotting potential losses or claims early only happens when data is live, interconnected, and visualised holistically. Without this, decisions are late, and opportunities are lost.

Intelligent workflows ensure that the right decisions happen at the right time. This means they happen when they can actually influence outcomes, not just explain them afterward.

Some examples of intelligent workflows include:

- ▶ Live P&L tracking that integrates voyage revenue, bunker costs, port costs, carbon costs, and other variables in real time.
- ▶ Real-time vessel performance monitoring against charter party warranties, highlighting potential claims or penalties early.
- ▶ Bunker planning dynamically integrated into voyage planning, considering route, port congestion, and emissions exposure together.

- ▶ Emissions compliance monitoring that updates dynamically as voyage parameters change, not after-the-fact.



Without reengineering workflows around these needs, adding more technology could end up just accelerating existing inefficiencies.

Identify the right people

Change management is essential. Operators should be trained not just on how to use the new system, but also on how their daily decisions, responsibilities, and collaboration will change in an intelligent environment. Executive leadership must champion process redesign, not just system rollouts.

Externally, selecting the right technology partner is equally important. The key stakeholder – vessel operator can easily work with vendors who understand voyage operations deeply, can speak their language, and focus on solving real operational challenges instead of simply providing software. A true partner helps embed operational intelligence at every stage, not just deliver tools.

Building intelligent operations starts by building the right team, both inside the company and with the right external partner.

| INTEGRATED vs INTELLIGENT Operations – What's the Difference? | |
|---|--|
|  INTEGRATED Operations |  INTELLIGENT Operations |
| Integrated operations connect people, processes, and systems across departments to improve efficiency and reduce manual work. | Intelligent operations use AI, machine learning, and analytics to automate tasks, predict outcomes, and guide proactive decisions. |
| In commercial voyage management, integrated operations ensure consistent data and decisions across the voyage lifecycle. | Intelligent operations optimise voyages in real time, adjusting routes, fuel plans, and compliance based on live conditions. |
| Integration creates a single, accurate operational picture for teams. | Intelligence continuously learns and improves decisions, adapting to changing commercial and regulatory needs. |

While an integrated VOS is already a reality today with platforms such as GeoOne, intelligent operations represent the next evolution of the voyage operations stack.

Just as Copilot transformed Microsoft 365's suite of apps and Gemini added intelligence to Google's suite, the future of voyage management will be shaped by systems that not only unify workflows but also think, learn, and optimise proactively.

ADDRESSING THE CHALLENGES OF VOS IMPLEMENTATION

Projects such as implementing a Voyage Operations Suite (VOS) can be complex and time-consuming as they involve many business components. They require adequate preparation and planning to ensure successful execution. Critical factors are sometimes overlooked, which can cause the project to fail. This is often the result of too heavy a focus on technical aspects such as software and processes while neglecting commitment from leadership and the effective management of organisational culture.

The following covers some of these challenges and how to overcome them. The information that follows is not designed to make you wary of the VOS rollout; the benefits are clear but as with any large project that overhauls business processes, certain preparations, risk management, and precautions must be taken²³ to be successful.

FINANCIAL PLANNING AND TIMELINE MANAGEMENT

One of the biggest challenges with a successful VOS implementation is the unawareness of the financial costs and time it might take to implement.

Even with cloud-based or modular systems, it can take a few months to fully implement, especially in larger or more complex organisations. The factors influencing this include the need to align internal teams and processes, the customisation of the system to fit business needs, data migration issues, which often take longer than expected, and delays in decision-making or user adoption.

As the VOS will touch many departments, it is critical to inform and prepare all team members involved. Leadership should be established and ensure adequate resources are assigned and employees are informed of immediate and long-term changes to their roles and responsibilities.

UNDEFINED SCOPE FOR FLEXIBILITY AND SCALABILITY

Another challenge organisations face when considering a VOS is understanding the level of flexibility and scalability it can offer. According to MacroFin, an accounting consultant, 50% of businesses face uncertainty when understanding whether an integrated project can adapt to their evolving needs.²⁴

It is therefore important to ensure that any large scale integrated project can grow with a shipping organisation as the fleet size grows or market conditions shift. A VOS



²³ Nestell & Associates (accessed Apr, 2025) [The ERP challenge: The background](#)

²⁴ MacroFin (Dec, 2023) [ERP implementations are hard, 75% of them fail](#)

with a modular architecture could be a good option as it enables organisations to adopt what they need today and expand later. This enables evolving needs to be met without requiring system replacement or overhauls.

Companies can phase the rollout across the different VOS modules, starting with low hanging areas first. For example, many organisations begin with voyage routing, vessel performance and emissions management, then expand into Port DA management tools and services, followed by bunkering, voyage analytics and laytime management.

This modular approach allows early wins, easier resource management, faster adoption, and reduced disruption during the transition.

There's a slow but steady move away from monolithic systems, encouraging modular, smartly integrated platforms.

In commercial voyage management, a scalable VOS is critical. A company that manages 6-15 vessels and grows to a fleet of 30 or more needs to be able to manage this effectively without exponentially growing the size of the team as well. Dharm Parikh, GeoServe's Head of Strategy and Partnerships, explained that a scalable VOS also means that smaller operators gain enterprise-grade capabilities, which have often only been limited to larger players. This enables smaller players to pursue new markets, partnerships, and strategies without being constrained by technological limitations, levelling the playing field.

MANAGING SCEPTICISM

There remains a degree of scepticism in the industry about whether sophisticated digital platforms genuinely deliver measurable financial returns. This is particularly true in a market where freight rates are dictated by external factors such as global supply and demand, fuel prices, cargo characteristics, geopolitics, and other factors.²⁵

Much of this reluctance stems from the industry's traditionally cautious nature. Many prefer to stick with what has worked in the past rather than venture into uncharted digital territory. As one interviewee explained, "Everyone knows the gaps. But no one wants to be the first mover. They wait for someone else to adopt, succeed, and then follow. But that mindset is slowly changing."

This concern is exacerbated by unknown costs. One operations manager told us that in just three years, the cost of their integrated voyage management platform has tripled, without a proportional increase in value. This has led them to be wary of investing in new offerings.

It is therefore important for integrated suite vendors to bring solutions to market that allow operators to start small and build as they realise the benefits.

MANAGING RESISTANCE TO CHANGE

Resistance to change among employees is a common problem that extends far beyond the maritime sector. People worry about disruptions to their workflow or job security. Kirimgeray Kirimli, Director at Flatiron Software and CEO of Snapshot Reviews said that by engaging employees early, responding openly to their concerns, and offering sufficient support, businesses can smooth the transition and foster a more welcoming attitude toward the new ERP system.²⁶

²⁵ Maersk (Feb, 2024) [7 factors affecting shipping costs](#)

²⁶ Forbes (May, 2024) [ERP implementation: 17 common challenges \(and how to overcome them\)](#)

UNCERTAINTY AROUND COMMERCIAL VALUE VERSUS OPERATIONAL EFFICIENCY

Another concern for operators is the commercial value versus the operational efficiency.

People may see how it benefits operations but not make the connection to the commercial aspect. One of the reasons for this is simply because different departments, such as operations, vessel performance, bunker procurement, laytime management, and compliance often work independently, leading to misaligned priorities.

Without a clear commercial mindset across voyage execution teams, decisions that appear efficient, such as optimising fuel consumption, port selection, or speed, can unintentionally reduce profitability or compliance.

Embedding a commercial mindset across performance teams, fuel optimisers, port cost controllers, and operators is essential.

THE FEAR OF BEING LOCKED INTO A SINGLE SUPPLIER

This research uncovered another common concern with moving to a centralised VOS. Another industry member we spoke with talked about their frustration of being forced into a one-size-fits-all platform that doesn't reflect the specific needs of different users across a business. "When I go out as a buyer, I want the mileage of a Toyota, the design of a Ferrari and the efficiency of a Volvo," he told us.

It is therefore important to choose a vendor that offers a modular approach, enabling you to build and add functionality as needed and tailor the system to your exact requirements. GeoOne by GeoServe delivers precisely this, allowing users to purchase and integrate individual modules to shape their VOS to their specific needs.

HOW TO AVOID IMPLEMENTATION FAILURE

According to Management Consultant Michael Donovan, the main cause of implementation failure is due to a reluctance from management to structure the organisation in a way that takes advantage of the system.²⁷ One ship operator told us that he sees organisations adding people to patch up gaps, which doesn't work. Instead, you must rethink the core.

Donovon's research identified five key reasons why integration projects fail.²⁸ Based on these, the following five questions can help a shipping organisation assess its readiness before proceeding with an integrated VOS implementation:

1. Is your operating strategy ready to drive business process design and deployment? Examine your current processes and flow of information. Donovan states that this activity is often overlooked due time and money constraints.
2. Are you aware and prepared for a potentially lengthy implementation?
3. Have you successfully completed pre-VOS implementation activities like reviewing data quality, aligning workflows, and stakeholder readiness? (This includes transitioning from fragmented to connected operations).
4. Do you have a plan in place to prepare your people to accept and operate a new system?
5. Are you aware of the costs and time required?

While the risks are real, the commercial, operational, and compliance gains from an integrated VOS outweigh the risks and could bring significant competitive advantage to companies that prepare thoroughly and stay committed to the transformation.

²⁷ Donovan, M (2001) [Successful ERP implementation the first time](#)

²⁸ Ibid



CONCLUSION AND RECOMMENDATIONS

In today's commercial shipping environment, operational complexity is escalating, making fragmented, siloed systems increasingly detrimental to profitability, efficiency, and compliance.

This research has uncovered some of the benefits of adopting an Integrated Voyage Operations Suite (VOS) to consolidate critical workflows, including bunker procurement, port disbursement, vessel performance, emissions compliance, and voyage analytics into a unified digital platform. By eliminating manual data entry, reducing reliance on outdated information, and fostering seamless collaboration, a VOS transforms voyage operations from reactive task management into proactive commercial orchestration.

The key benefits of this unified approach include improved real-time decision-making, scalable

automation, reduced operational risks, and enhanced regulatory compliance. Implementing a Commercial Control Tower (CCT) within the VOS further optimises decisions such as bunkering by balancing cost, compliance, and operational efficiency in real time.

As maritime operators navigate growing market and regulatory pressures, integrating and eventually advancing to intelligent operations will not just simplify workflows, it will future-proof their fleets, driving profitability and competitive advantage in an increasingly complex landscape.

01 ORCHESTRATE, NOT JUST OPERATE

Voyage management is no longer about ticking off a list of tasks. Today's operators must orchestrate data, workflows, and decisions across departments to deliver meaningful commercial outcomes.

A VOS should do more than streamline processes. It should enable teams to act proactively, aligning bunker planning, emissions compliance, port cost control, and laytime management around a shared commercial objective. This creates a single source of truth, aligning chartering, operations, port agents, and finance around one integrated plan and dataset, with shared voyage KPIs.

When stakeholders share situational awareness and common goals, mid voyage corrections can be made collaboratively, not in departmental silos. Breaking away from disconnected, manual processes reduces duplication, delays, and errors.

Encourage teams to think beyond their immediate responsibilities. A collective, orchestrated approach enhances safety, eliminates wasteful handoffs, and ultimately drives higher on-time performance and profitability.

To sustain a competitive edge, organisations must build operations functions that think commercially and work across silos. Implementing a VOS is not just an IT upgrade, it's an opportunity to reimagine how work gets done. Engage teams to rethink voyage workflows end to end, removing redundancies and adding automation wherever possible.

For instance, bunkering can be transformed through an integrated platform that links voyage planning with real-time fuel prices and supplier data, optimising refuel timing and vendor selection. This brings transparency to fuel procurement and reduces risk, unlike the old model where each port call handled bunkering in isolation. Similarly, enable real-time schedule or routing adjustments by ensuring data flows instantly to all relevant parties.

02 INTEGRATE SYSTEMS BEFORE ADDING INTELLIGENCE

Before making operations intelligent, it's essential to establish a solid foundation of data and processes. That means connecting core workflows within a unified operational environment before layering in AI and analytics, as intelligence cannot thrive without integration.

This approach starts with consolidating voyage data, chartering, operations, fuel consumption, weather, and other inputs into an integrated VOS. The VOS becomes the backbone for intelligent operations, providing the structure needed to support advanced tools and insights.

Organisations that skip this step risk accelerating fragmented processes with faster technology, magnifying inefficiencies rather than resolving them. Without integration, even the most sophisticated AI tools will be starved of the accurate, timely information they need to deliver value.

Resist the urge to chase AI trends until your data infrastructure is robust. Prioritise projects that connect legacy systems and clean up data pipelines, ideally using a modular integration architecture that supports future scalability.

Integration is the stepping stone to meaningful intelligence. To support a dynamic business environment, the VOS should be modular, allowing components like scheduling, voyage tracking, analytics, and billing to be added or upgraded without disrupting the broader system.

This flexibility is vital as market conditions, regulatory requirements, and business priorities evolve. Shipping operations must accommodate rising data volumes and new compliance demands, so systems must be built to scale and adapt from the outset.

Finally, ensure your platform can integrate with emerging technologies such as AI, making your voyage management capability resilient, adaptable, and future-proof.

03 CHAMPION CHANGE WITH THE RIGHT TEAMS

Technology alone does not transform operations, but people do.

Successful VOS implementation requires assembling internal champions from operations, performance, claims, bunkering, compliance, and finance. Drive the transformation with a dedicated cross-functional team that owns the integrated voyage process from start to finish. Include representatives from chartering, operations, IT, finance, and other key units to ensure all perspectives are covered. This team should champion new workflows, coordinate training, and address resistance among staff.

For organisations where scaling internal resources is a challenge or where dedicated expertise is not available, Commercial Voyage Management as a Service (CVMaaS) can provide a practical alternative.

This model brings together skilled voyage managers, standardised workflows, and an integrated technology platform into a unified solution, allowing companies to benefit from integrated operations without the full overhead of internal system building and talent acquisition.

Choosing the right external partners is equally critical. Vendors must not only provide flexible platforms but also understand the daily realities of voyage management.

Transformation succeeds when both internal teams and technology partners work together towards a shared operational and commercial vision.



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