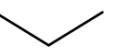


DTN^o

Uncharted Waters:

The Journey
to Digitalization
in Shipping



KEY FINDINGS

1 Shipping Under Pressure

2 Weathering the Storm

3 Weather Maturity in Shipping

4 Digitalization: Challenges, Opportunities, and a Pandemic

5 Data Integration

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Increasingly, the maritime industry is transitioning towards digitalization. Digital solutions are helping ship owners and operators improve vessel performance, increase crew and vessel safety, and reduce operational costs. And while there is no doubt that the technology provides greater access to operational intelligence, a wide gap exists in the data complexity and integration used among ship owners and operators.

The research report **“Uncharted Waters: The Journey to Digitalization in Shipping”** explores the market pressures ship owners and operators face, the impact of digitalization on their businesses, and how their digital systems integrate weather data. Several of the key findings highlight ongoing challenges and transformations in the industry.



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Decarbonization

It is not surprising to find decarbonization at the top of the list of industry pressures. What is surprising is that most respondents said non-regulatory requirements, such as greenhouse initiatives, were as much of an industry pressure as regulatory requirements for decarbonization. This suggests that the drive to reduce greenhouse gas emissions goes beyond mandatory actions and comes from multiple sources, including the company's commitment, stakeholders, and the public.

Digitalization

Digitalization was another top pressure, according to respondents. A collaborative, data-sharing culture and clearly defined mission are two important factors in facilitating

digitalization. Interestingly, these factors also ranked high as obstacles, which clearly highlights that shipping experts know digitalization journeys require fundamental organizational changes driven by leadership buy-in and company mission.

COVID-19 and digitalization

Around the world, the pandemic either accelerated or stalled digital progress, and the shipping respondents said the same. While slightly more than half reported no change, the other half said the pandemic accelerated digitalization. Maritime operators who were either early in the journey or leaders reported the biggest changes.

Climate impact

As a data, analytics, and technology company providing insights to weather-sensitive companies, DTN

also investigated how ship owners and operators integrate weather data. While shipping experts overwhelmingly believe enriched weather data is necessary, one in three don't have it feeding into their system. This lack of integrated weather data, along with recorded increases in wind strength, wave heights, and wave energy, impacts vessel efficiency and safety.

These, along with the other findings in the report, demonstrate that the maritime industry is navigating uncharted waters when it comes to digitalization. Advancements in data collection, technology, and computing power, along with leadership, are key to facilitating a smooth, accelerated journey. ■



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Shipping under pressure

External pressures are forcing the shipping industry to invest heavily in decarbonization, with regulations as the key catalyst, but the pressure is on to move beyond regulations.

Next to upgrading ships, this means increasing interest and investment in decision-making capabilities that require enhanced digitalization.

Decarbonization Drivers



Weathering the storm

Shipping companies must adapt to changing weather patterns and warming oceans that impact fuel efficiency, CO₂ emissions, as well as crew, ship, and cargo safety.

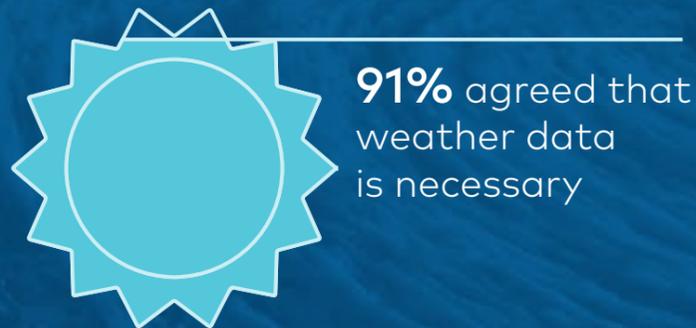
While research shows an increase in severe weather events, the industry seems to be at odds, which can jeopardize crew and ship safety if measures are not taken.

24% think the industry is being impacted



Weather maturity in shipping

Even though the weather has a big impact on every aspect of shipping and the supply chain, often it is not integrated into systems or decision-making tools. These integrations are usually part of broader digitalization projects that are complex, costly, and time-consuming. With the availability of SaaS platforms with pre-integrated weather data, shipping companies can accelerate their digitalization journey.



2 in 3 have weather data feeding into their system



Digitalization: challenges, opportunities

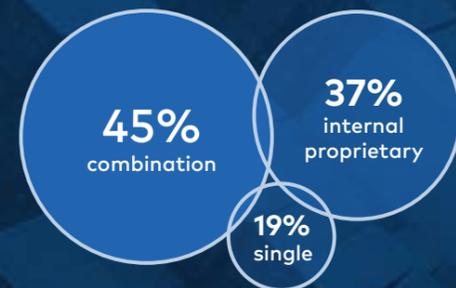
Every shipping company has some kind of data integration project running; however, these are often done in a silo. Digitalization delivers the greatest value when performed across an organization, built on a data-sharing culture with processes and people driven by a clear leadership buy-in and company mission. Many respondents feel that these fundamentals are missing, which provides a significant barrier to accelerating digitalization.

47% saw accelerated digitalization due to the pandemic



Data integration

Sophisticated data integration projects typically rely on proprietary systems used by market leaders more advanced in their integration journey.



Increased availability of innovative single-system platforms featuring pre-integrated data makes access to similar capabilities possible. With strict regulations on the horizon, the number of shipping companies that adopt a single system will grow as data integration becomes a key requirement.



1 Shipping Under Pressure



The shipping industry faces pressure from multiple sources centered around the **environment, logistics, profit, and efficiency.**

From the survey, the top three sources of pressure reported by respondents came from investors, regulators, and supply chains, where respondents were asked to pick three choices. These pressures vary, depending on whether companies own vessels or not. For companies that own vessels, the biggest pressure came from regulators (31%). For companies that don't own ships, the single biggest pressure came from investors (35%).

The top three external pressures facing the sector were non-regulation-driven carbon emissions focus, decarbonization regulation, and digitalization. When it comes to responding to these pressures, companies that operate vessels are also more likely to have a decarbonization strategy that looks beyond current requirements, with 94% responding this is in place. This compares to 83% for companies that don't operate vessels and 70% of companies that technically operate or charter vessels as part of a pool. However, it's a continuous process; as one respondent said, *"Ship owners and operators must continuously improve the efficiency and environmental performance to adhere to the compliance policies."*

The survey results also show that geography plays a role in shaping the external pressures for respondents based in Europe and Asia. The biggest pressure reported from 25% of European-based companies is non-regulation-driven carbon emissions focus (e.g., green initiatives). For shipping companies based in Asia, 27% reported the biggest pressure is decarbonization regulation.

When speaking with mid-sized companies based in Southeast Asia, countries are typically later in the journey. They report being less focused on advanced digitalization and more on maintaining the business. They increasingly rely on third-party platforms to enhance digitalization, stay in the game, and manage the regulation pressure — the current view from the market is that there is no time for large weather data integrations.

"Ship owners and operators must continuously improve the efficiency and environmental performance to adhere to the compliance policies."

DIRECTOR, PERFORMANCE MANAGEMENT

Most significant pressures for shipping companies

Top 3 by Region
 - - - - - Europe
 APAC

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Non-regulation driven carbon emissions



Decarbonization regulations



Digitalization



Supply chain efficiencies



Demand for cost-saving efficiency



Cyber threats



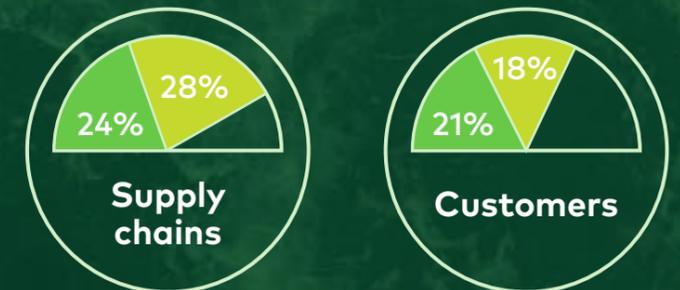
Health and safety improvements



Top external sources of pressure



Top external sources of pressure for ownerships



■ Company owns vessels
 ■ Company doesn't own vessels



2 Weathering the Storm



Weather impacts every part of the shipping industry — from fuel efficiency and CO₂ emissions to crew, ship, and cargo safety.

Scientific research validates that extreme weather-related events have a business impact, yet 74% of respondents don't think the industry is impacted by changing weather patterns and warming oceans.

This may be due to gradual changes, like increasing sea surface temperatures and rising sea levels, that may not be felt immediately. However, these changes are catalysts for the most widely known and accepted conditions that directly impact shipping.

From 1901 through 2020, sea surface temperature rose at an average rate of 0.14 degrees Fahrenheit per decade. The recent IPCC report shows a further rise of one degree is expected, and as sea ice retreats in the Arctic, coastal sea surface temperatures will rise more. These warmer sea surface temperatures increase the rate of water evaporation, which feeds moisture and energy into storms and are associated with more rapid hurricane intensification — the top concern for respondents.

The research also indicates that ocean conditions are becoming more difficult for shipping companies, with more powerful winds, increased wave heights, stronger wave periods, and changing wave direction.

Higher moisture content in the warming atmosphere brings heavier precipitation events, with more heavy snow during the winter in Arctic areas and disruptive precipitation in regions of tropical cyclone landfall. It also shows more heavy thunderstorms in autumn over the Mediterranean. **These findings align with respondents' second and third-highest weather-related concerns, monsoon and heavy rains,** followed by lightning and thunderstorms.

It is a given that shipping companies take weather forecasts into account when planning shipping routes. But extreme weather can arise suddenly, and it is difficult to accurately predict a weather event's precise evolution. Most route planning is based on certain assumptions, but room must be left for a flexible response due to these more frequent, sudden weather changes. **Shipping companies that don't plan for a changing climate and sea states will be challenged by operational efficiency and safety in the future.** ■

Top weather concerns

1. 61%

Tropical & extra-tropical cyclones, hurricanes, or typhoons

2. 53%

Monsoon & heavy rains

3. 42%

Lightning & thunderstorms



Sea surface temperatures...

are rising at an average rate of **0.14 degrees Fahrenheit per decade**.¹

This is a catalyst for more extreme weather events.²



Sea levels...

are rising **up to 100cm**, and may change tidal circulations in shallow water.

Port and terminal accessibility will be affected.²



Tropical cyclones...

that develop into major hurricanes or typhoons will **become even stronger**.

Some may survive mid-latitudes, regaining intensity.²



Arctic ice cover...

is decreasing even further in summer and autumn.

More reliable shipping routes will become available north of Siberia.²

Precipitation...

is intensifying due to higher moisture in the warming atmosphere.

This impacts shipping operations in areas of tropical cyclone landfall.²



Ocean energy...

is increasing, resulting in rougher oceans.

Expect more powerful winds, increased wave heights, and stronger wave periods.³



¹ EPA, Climate Change Indicators: Sea Surface Temperature

² Intergovernmental Panel on Climate Change, Climate Change 2021

³ University of Melbourne, Ocean Waves and Winds Are Getting Higher and Stronger



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Organizations differ significantly in their adoption and use of weather data; however, **nearly all respondents agreed (91%) weather data is necessary.**

Few capitalize on the power of integrated data, demonstrated by only **one in 10** respondents having fully integrated weather data and **one-third** not having weather data feeding into their system.

The **DTN Weather Maturity Curve** classifies organizations based on their weather data adoption. It's a framework to assess organizational maturity based on the internal understanding, influence, and usage of weather data – focusing on the role weather data plays in decision-making, the types of weather tools and data used, and the appreciation of how weather influences business performance.

The **five-stage maturity curve encompasses all phases organizations can pass through on the journey toward weather maturity.** Organizations can also have capabilities across one or more stages of the maturity curve. Successful progression up the curve happens in phases, and the journey towards weather maturity is different for every company. Organizations must make strategic decisions about what they want to achieve, the priorities, and the specific measures to implement. Understanding the stages

in the curve can help the company formulate a weather road map. While no organizations from the research are yet at stage five, it offers a future direction for the industry that unlocks AI-driven decisions, applying predictive or prescriptive strategic and supply chain decision making.

Across respondents*, **89%** have capabilities at stage two, indicating that

their current weather technology enables them to check weather forecasts to help in immediate and contained circumstances, for example, avoiding heavy weather, securing the vessel, and enhancing the crew's safety.

Nearly half (**48%**) have capabilities at stage three or higher on the maturity curve, providing a cohesive single view from



*2% of respondents did not know their stage in the maturity curve.



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ship-to-shore. These capabilities help with decision-making in areas like performance-based routing or minimizing CO₂ emissions. **Only 9% of shipping companies report having stage four capabilities**, which incorporates complete weather data integration supported by machine learning. Respondents with these capabilities can access foresight and planning across the full distribution chain, such as the expected time of arrival, loading, unloading, and just-in-time port arrival.

Weather maturity appears to go hand-in-hand with access to data on the whole, with weather-mature shipping executives more likely to have additional data feeding into their system. Similarly, they generally demonstrate more confidence in their company's digitalization strategy. Only **29%** think they need to invest in technology partners but are unsure of where to start — compared to **69%** on average.

The survey results indicate more mature organizations also access multiple data feeds. A higher proportion of respondents at stage four report data provides for the following points compared to respondents at lower stages: port information (**93%**), market/cargo intelligence (**86%**), performance (**79%**), and routing (**79%**).

More mature organizations are also more likely to be confident with their data partners and think the pandemic has

Solving for weather factors: a collaborative approach for making weather-enhanced decisions

Whether onshore or at sea, the weather is always a factor in shipping. So, how does the weather factor apply to operational efficiency? It is the time added or subtracted from the voyage plan based on likely weather conditions.

Traditionally, companies have applied the weather factor by first planning the shortest route. Then, they add the weather and other factors that may impact the voyage as an average percentage. This is typically based on previous voyage data or inputs from captains. However, this approach lacks accuracy and can significantly deviate from actual conditions.

One leading shipping company decided to solve the issue by collaborating with DTN. The solution takes historical weather data from the last 40 years, simulates the voyage between different points in the world, and calculates the weather factor for each route. The

information is then delivered via API, so the company can access the database for instantly-verified reports to support voyage planning.

The results? While mild seasons and short routes do not show strong deviations, in rough-weather areas during winter, the weather factor shows significant weather-related delays — something not seen using the standard climatic average weather.

The real strength from the weather factor solution comes during seasons and in locations where the extra time required can be over 10% more than the original estimation, such as in the North Atlantic or North Pacific. Applying climatic averages provides less accurate percentages, which can result in negative financial implications. The weather factor solution offers more realistic figures. ■

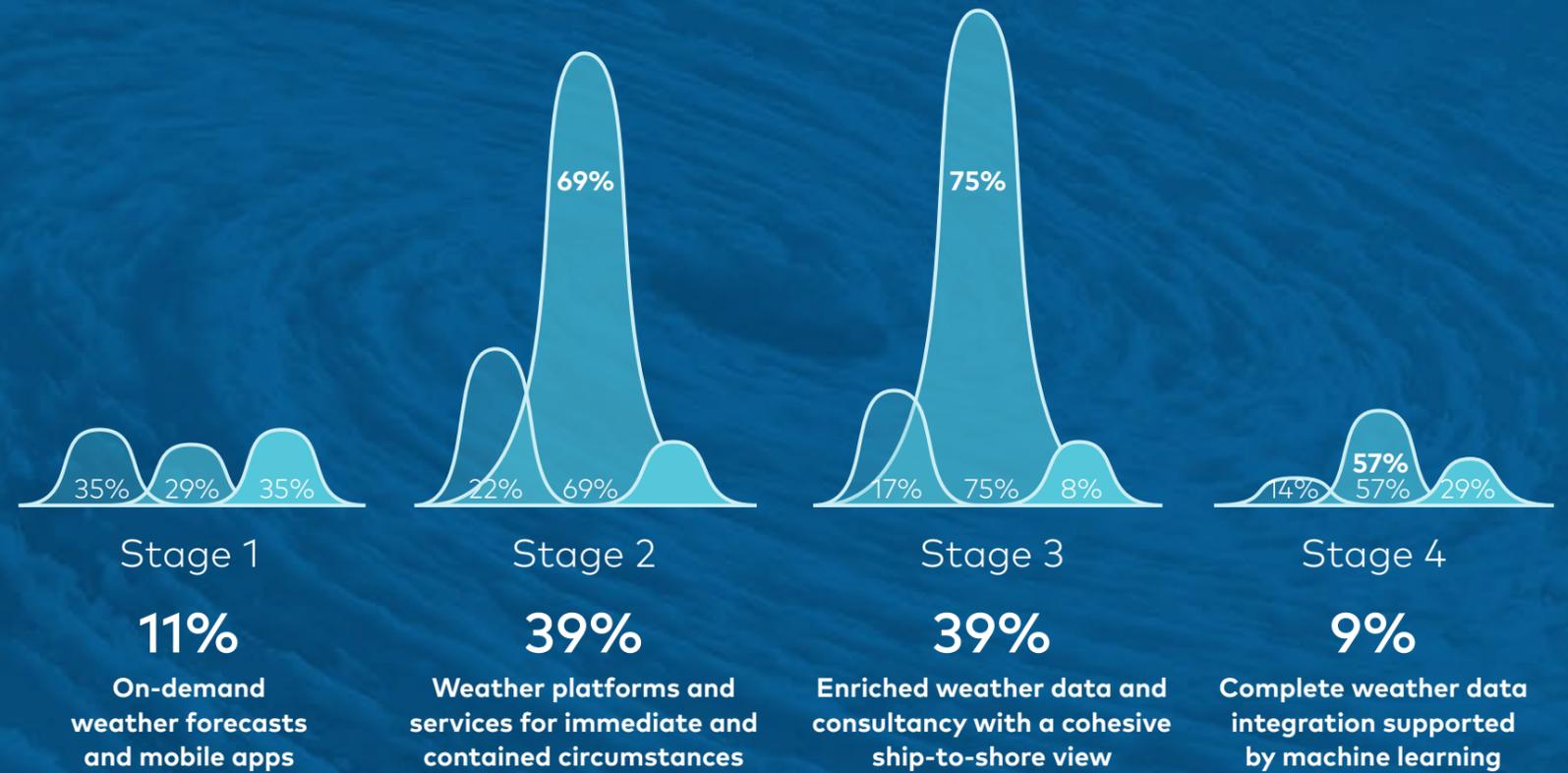


triggered their digitalization strategy. For instance, 79% agree that the pandemic has accelerated their company's digitalization strategy, compared to 39% of respondents at stages two and three.

Progressing up the curve is easy at the early stages. Stage two capabilities are readily available through point solutions that are proven to address specific use cases. **However, further up the curve, more cross-collaboration becomes necessary.** The integrations needed for stage three require wider collaboration and IT support. Moving to stage four becomes more challenging, as it requires a company culture and organizational redesign to embed data integration as part of existing processes.

As visualized in the graph on the right, overwhelmingly, most respondents report that they are not close to the next steps in their maturity journey. For those at stage two, 69% report they're midway through their stage but are not ready to progress to the next stage on the maturity curve. For respondents at stage three, it's 75% in the same position. And at stage four, 57% are also midway in their journey. Though, with stage four, 29% report that they are close to exploring a more innovative weather data approach, indicating that the more mature organizations are also more likely to look to progress further up the curve. ■

Weather maturity curve: most respondents sit in the middle



91% agree weather data is necessary, but few capitalize on the power of integrated data

2 in 3 have weather data feeding into their system

1 in 10 have fully-integrated weather data



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Recently the shipping industry has undergone a digitalization transition from theory into reality. A few years ago, autonomous shipping and Internet of Things connected vessels were a lofty idea; **today, they are being tested in live environments.**

Progress is opening up new doors for shipping companies to use digital technology and data to improve their knowledge about customer behaviors, competition, and future trends. **But when it comes to weather, the shipping industry falls along a broad technology spectrum** — shown in the breadth of organizational maturity, from highly connected vessels analog data accessed once a day.

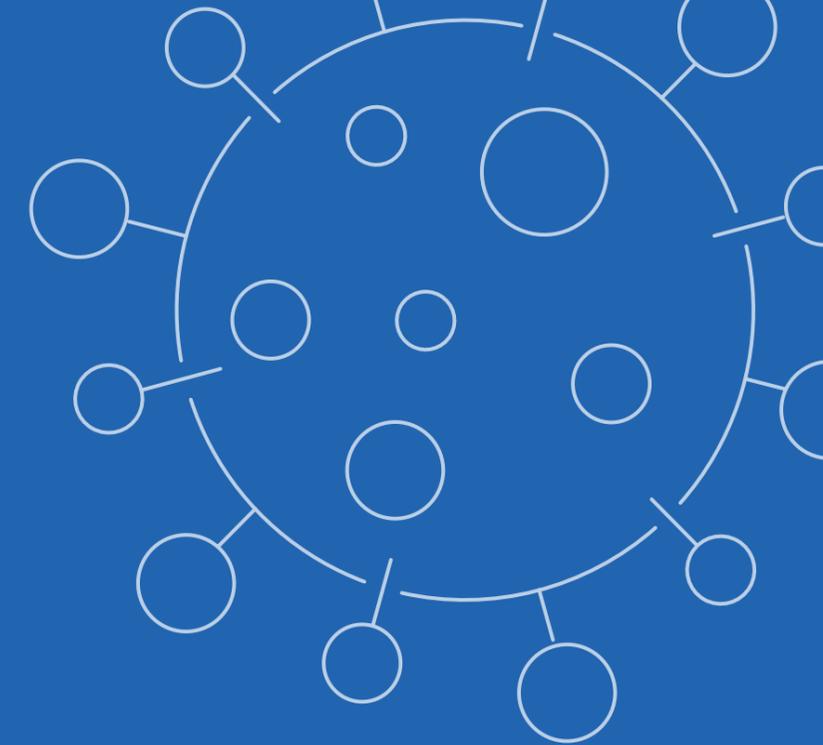
There is no doubt that digitalization provides greater access to operational, market, and environmental intelligence in the shipping industry. **The challenge is how to collate, access, and share data across the company.** Considering the factors that help facilitate

digitalization, **57%** report a collaborative, data-sharing culture, **37%** state their data collection process, and **32%** responded with a clearly defined company mission. **These factors undoubtedly highlight that shipping experts understand that digitalization journeys require fundamental organizational changes** — a data-sharing culture with clear processes driven by leadership buy-in and company mission.

Interestingly, these factors also ranked high on the obstacles to digitalization, including **30%** of respondents who state poor data management is a barrier and **29%** reporting issues with data silos and a lack of integration.

"Companies are focused on protecting their data instead of sharing it widely in the maritime sector, which causes barriers to collaboration."

MANAGER, COMMERCIAL OPERATIONS



Digitalization during a pandemic

Nearly half of shipping experts agreed that the pandemic accelerated their digitalization with the greatest increases in companies who are either early in their digital journey or more digitally-mature organizations. These respondents saw the pandemic as an impetus to evolve their digitalization strategy. Among those who did not see accelerated digitalization during the pandemic, several respondents cited "recovering from COVID" as one of their biggest digitalization frustrations. ■



When respondents were asked to rank their barriers to digitalization, **45%** reported the single biggest obstacle is a poor data collection process. **One in five** also identified a lack of leadership buy-in as a top barrier. It was higher for lower seniority respondents, with **28%** of managers finding this a top concern.

Respondents were also asked to qualitatively comment on their biggest frustrations, with **35** including the technologies themselves in their response. Cost and budget were also frustrations for **27** respondents, and concerns remain regarding the safety and cybersecurity of digitalization. ■

"Budget concerns and constraints are the biggest challenges and frustrations we are facing as a company."

MANAGER, TECHNICAL OPERATIONS

Developing weather-enhanced data: bringing together market expertise around use cases

Market and regulatory pressures are driving the need for integrated data from multiple sources in order for the shipping industry to remain competitive. Shipping companies require customized weather data tailored and integrated for specific use cases. But managing multiple points of data that drive time sensitive, confident decision making is challenging. By collaborating with market experts and specialists, DTN is developing innovative use cases for weather data integration that target key needs from shipping companies.

Vessel profiles are an example. Knowing how the weather will impact your specific vessel is almost as important as knowing the forecast itself. A digital twin model of the vessel determines the forecast's impact on the type of vessel. Working in collaboration with partners, DTN has created a library of vessel profiles that contain the digital twin

model with advanced algorithms for the resistance and the impact of winds and waves on specific vessel types.

Another example is container loss prevention. Analyzing a vessel's unique attributes during specific weather conditions allows shipping companies to address causes of container loss. DTN brings together enriched weather data in conjunction with partners. It works by combining accurate, detailed weather forecasts with unique operational data and detailed hydrodynamic models from each ship to advise captains on the best route. Weather-optimized route planning allows vessels to avoid the types of weather that cause ships to shed cargo. Providing captains with this information as early as possible enables more efficient decision-making. ■



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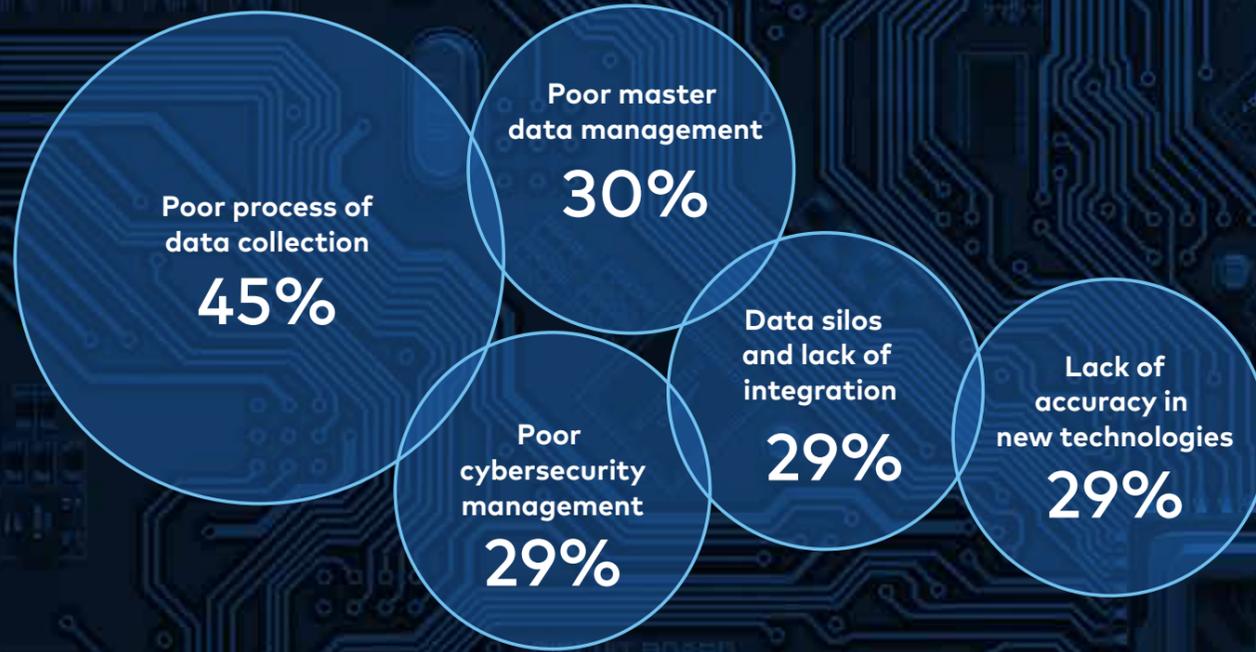
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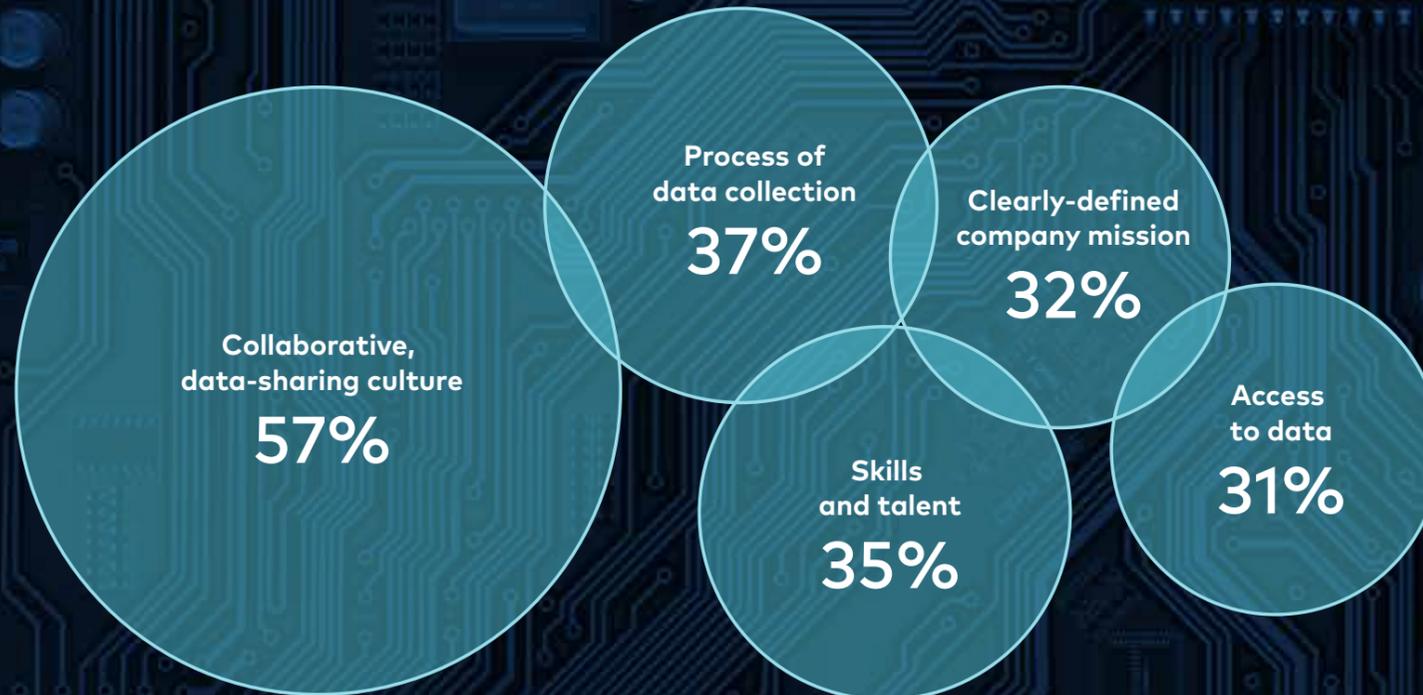
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Top barriers for digitalization



Top facilitators for digitalization



COVID-19 & the maturity curve

47% agreed COVID-19 accelerated their digitalization.

STAGE 1

71%



STAGE 2

39%



STAGE 3

39%



STAGE 4

79%



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The industry generates **huge quantities of data**, from every aspect of the supply chain from sensors in dispatch warehouses to on board ships, ports and trucks.

However, according to nearly half of respondents, data collection is the number one barrier to digitalization.

Single vs. Proprietary Systems

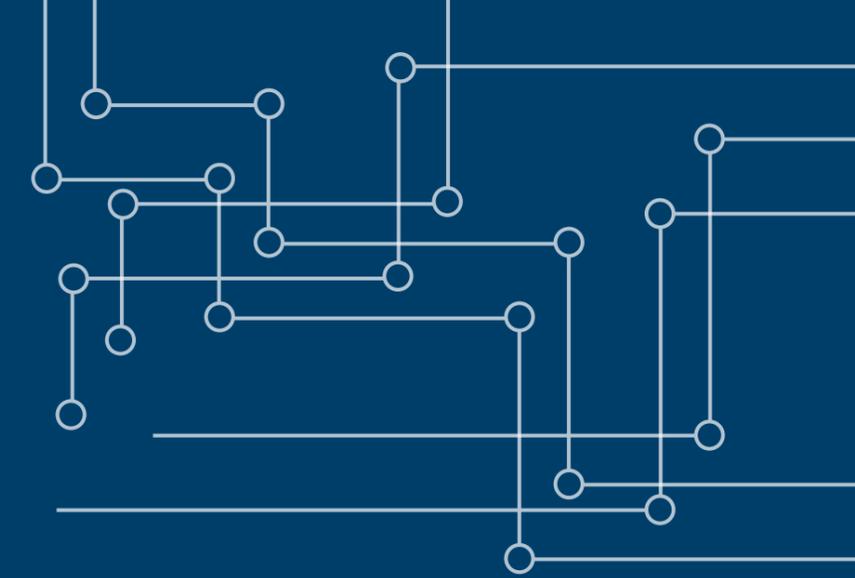
To make all this data accessible, nearly half of the respondents use both a single system and an internal proprietary system for vessel performance and maintenance, compared to **37%** that only use an internal proprietary system and **19%** that use a single system. Internal proprietary systems require customized data integration, bespoke and built for the organization in question, whereas single systems are typically a standard purchased platform with pre-integrated data.

The results indicate that most shipping companies choose a hybrid approach though, combining bespoke solutions with a single system. Shipping companies can also take a project-based approach adding to the single system, defining specific use cases that require customization and looking to integrate the necessary data.

Convenience and Performance

Single system users are more attracted to convenient, accessible solutions, with **75%** choosing an all-in-one solution, even if they can't cherry pick multiple data partners. Only **55%** of respondents using internal proprietary systems would choose an all-in-one solution, forgoing opportunities for advanced solutions integrated into existing systems. Since single system users rely on third-party system integrators to consistently deploy new technologies and features, **82%** reported that the pandemic accelerated their company's digitalization strategy compared to **42%** with an internal proprietary system and **36%** with a hybrid system.

But there is a trade-off for convenience. Only **36%** of organizations with a single system ranked their shore-based digitalization performance above four on a scale of one to five, compared to **66%** of organizations that combine a single system integrated with an internal proprietary system. It's a similar story for vessel-based systems; **37%** of respondents with both ranked four or above compared to only **11%** of organizations with a single system integrator.



One of the challenges shared by respondents was a "lack of experience in implementing newer technologies."

DIRECTOR, TECHNICAL OPERATIONS



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Leaders forge the digital path

More advanced companies are already looking at innovative ways to stretch their use of data. Leaders in the industry are investing in bespoke solutions tailored to their specific needs and use cases. These cutting-edge approaches push forward the industry's technological capabilities. The integrations are usually part of broader digitalization projects that are complex, costly, and time-consuming. As one survey respondent said, it's about "investing in the differentiating capabilities of digitization."

The survey responses correlate this, indicating organizational maturity is an indicator of a more advanced decarbonization strategy, with **93%** looking beyond the current requirements. Less mature organizations are less likely to have one in place, with only **69%** of respondents at stage three of the maturity curve having an advanced strategy.

Business drivers vs. business value from weather data integration

Full weather data integration is an emerging phase in digitalization for the shipping sector. Shipping companies are understandably focused on vessel improvements like fuel type and ship engine optimization first. But as companies attempt to navigate increasingly complex market conditions, combining these existing optimization approaches with weather-enhanced use cases helps provide an edge. Incorporating weather data into digitalization allows shipping operators to overlay information for a complete situational analysis, supporting more confident decisions. Applying this analysis to a fleet of vessels in different locations multiplies the value weather insights provides.

The industry vessel-optimization-first approach is reflected in the survey data, which shows a gap between the highest value use cases for enriched weather data and the business drivers behind purchases. For example, with decarbonization as highest-ranking external pressures, **29%** of respondents ranked decarbonization planning as a high-value weather use case, but only **20%** considered it a business driver. On the other hand, demand for cost saving efficiencies and health & safety improvements are the lowest-ranking external pressures, but reduce fuel consumption (**41%**) and safety (**37%**) are the highest business drivers for enriched weather data.

"Using machine learning technology to break down variations and complexities to determine consistent patterns for weather forecasts is valuable."

HEAD OF QUALITY ASSURANCE,
MARINE STANDARDS & COMPLIANCE

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Types of Data Feeding into Systems

Many of the data sources that are feeding into the systems of shipping companies, are weather influenced. For instance, performance and routing data are broadly used to enable shipping companies to make better fleet operating decisions. Especially fuel consumption, which can account for half of the operating costs, allows for significant savings when they are integrated with weather data. Organizations that do not own vessels are much less likely to have performance and routing data. For performance data, the split is **61%** of respondents whose company owns vessels, compared to **42%** where the company does not. And for routing data, it's **71%** for those that own vessels, compared to **54%** that don't.

Weather data integration will reach the next phase with the availability of real-time data delivered by onboard sensors. This allows companies to monitor cargo data, engine performance, and more. By combining weather conditions and sensor data in real-time, operators can adapt to conditions as they develop. **Previously, this level of data was only made available once a day via the noon report. Tomorrow, it's up to the minute. ■**

Making enriched weather data available through different types of systems

Shipping companies can bring external in data through three means: internal proprietary systems, single systems, or a combination of both.

Internal proprietary systems use customized data integration, built specifically for the organization, whereas single systems are typically an off-the-shelf platform with pre-integrated data.

In general, large shipping companies lead the way on customized digitalization. They have the staff and resources to bring data together in a way that suits their process, including custom integration of enriched weather data. Proprietary IT systems provide a smooth connection between the shore office and the fleet at sea. A leading shipping company is working with the team at DTN on custom integration of weather data which allows their teams to track conditions and adapt routes to optimize performance. To add an extra dimension, the company uses the data for verification, checking how accurate

the weather forecasts and predictions were in optimizing fuel efficiency and reducing environmental impacts.

Fortunately, advancements in technology and computing power have enabled shipowners who choose single systems to immediately access rich data due to integration partnerships. For example, DTN works with a range of shipping platform developers to provide integrated weather data that works within existing systems. The market for these SaaS platforms is growing fast, enabling shipping companies to quickly and easily implement integrated decision-making tools and accelerate digitalization in the industry as a whole.

The third solution for integrated data is a hybrid. As single source systems advance in capabilities and data aggregation, both large and small ship operators will have more complex and accessible data at their fingertips for swift, confident decisions. ■



Paths to digitalization

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Single system

A standard purchased platform with pre-integrated data

19% single

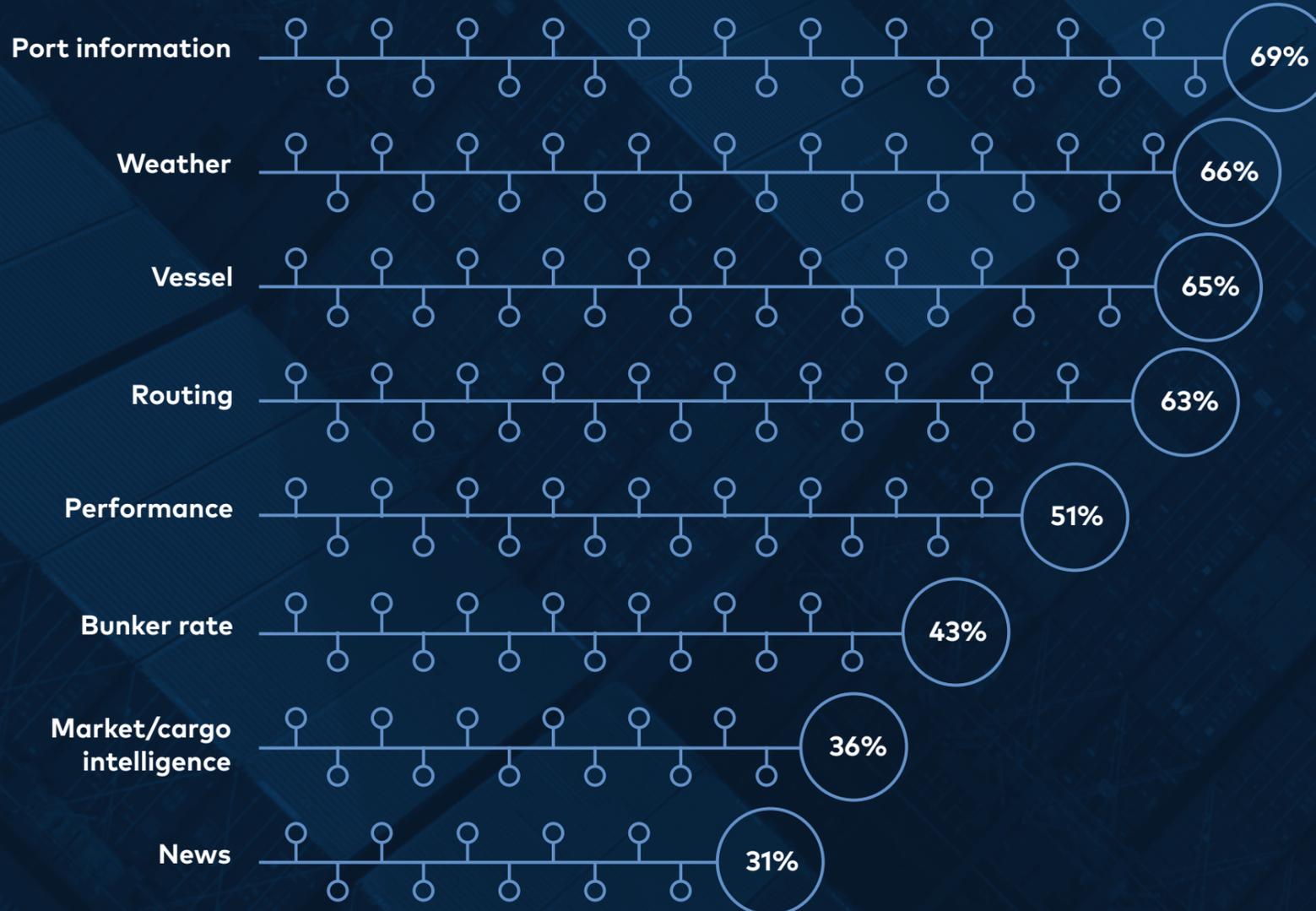
45% combination

37% internal proprietary

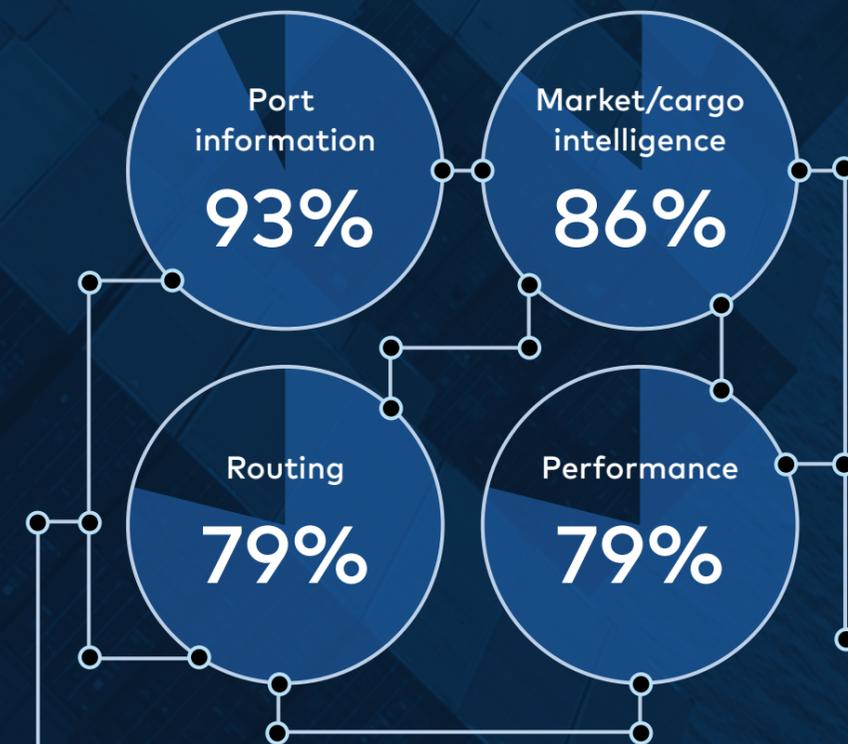
Internal proprietary system

Customized data integration, bespoke and built for the organization in question

Types of data feeding into systems



Stage 4 companies integrate more data sources



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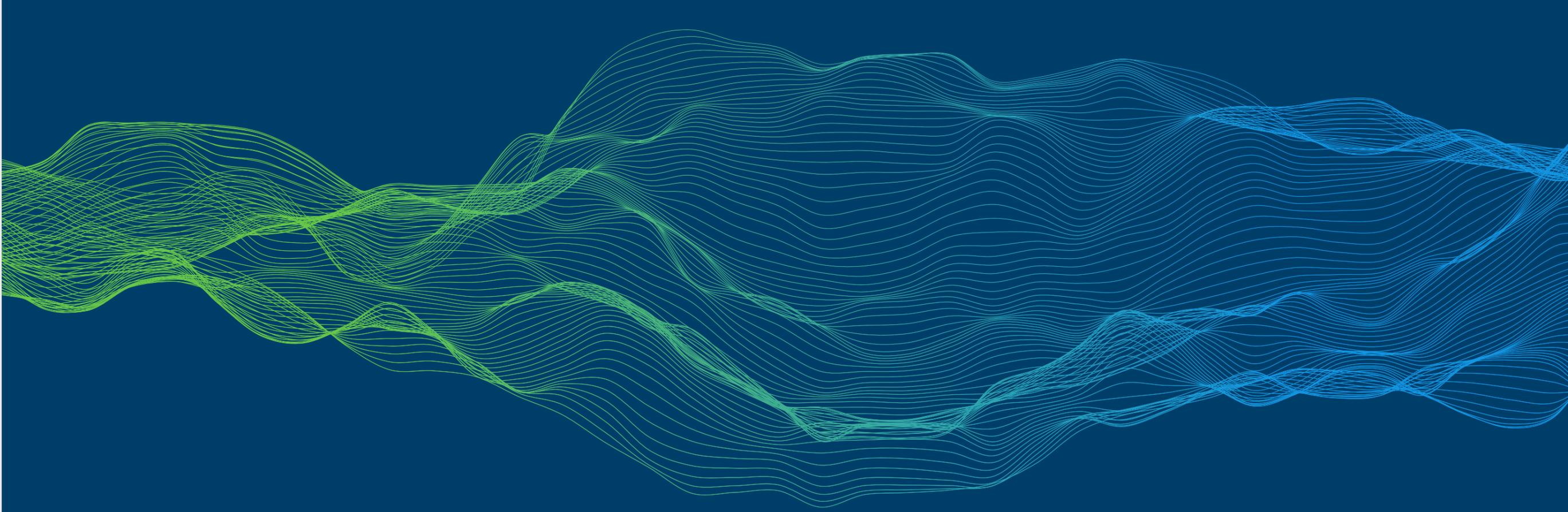
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ABOUT DTN



The shipping industry is starting to see digitalization transition from action into reality. **Ideas that were only concepts a few years ago are now operational.** There is no doubt that digitalization provides greater access to operational, market, and environmental intelligence in the shipping industry.

Organizations that enhance their maturity to weather data will be better equipped to advance their digitalization journeys and respond to external pressures facing the market. Responses from the survey show the industry values enriched weather data. The opportunity now is to ensure this data is feeding into shipping systems, so the industry can accurately forecast and react to conditions in conjunction with additional datasets — enhancing insight and ensuring a competitive edge.



1 Shipping Under Pressure

2 Weathering the Storm

3 Weather Maturity in Shipping

4 Digitalization: Challenges, Opportunities, and a Pandemic

5 Data Integration

The impact and frequency of weather events and the pressure from market forces are **driving digitalization developments in shipping.**

This research aims to verify this hypothesis by exploring respondents' attitudes towards weather events, the pressure of market forces they face, and what digitalization means to them and their businesses.

Methodology

Online survey conducted in partnership with alan. agency and iResearch in July and August 2021. Survey results reflect 150 senior professionals in the shipping industry whose organizations are headquartered in Europe or Asia.

Respondents

To qualify, panel-sourced respondents had to represent individuals working for ship owners and charterers in Europe or Asia. Job roles range from managers upwards in functions responsible for performance management, digital management, product management, and IT. All vessel types were represented in the survey with more than half reporting operating dry bulk, container, and reefer vessels.





Operational Intelligence for Confident Decisions

As a data, analytics, and technology company, DTN delivers operational intelligence to organizations with complex supply chains around the world. We are committed to breaking through the noise and providing operationally-critical, actionable intelligence that customers can depend on to drive confident decision-making. We have earned our customers' trust by delivering real-time insights that ensure decisions can be made quickly and confidently. Together with our customers, we uncover new insights and create solutions that improve entire industries. And, we do so while maintaining our independence to ensure our customers can make the right decision for their bottom line, their customers, and their employees.

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