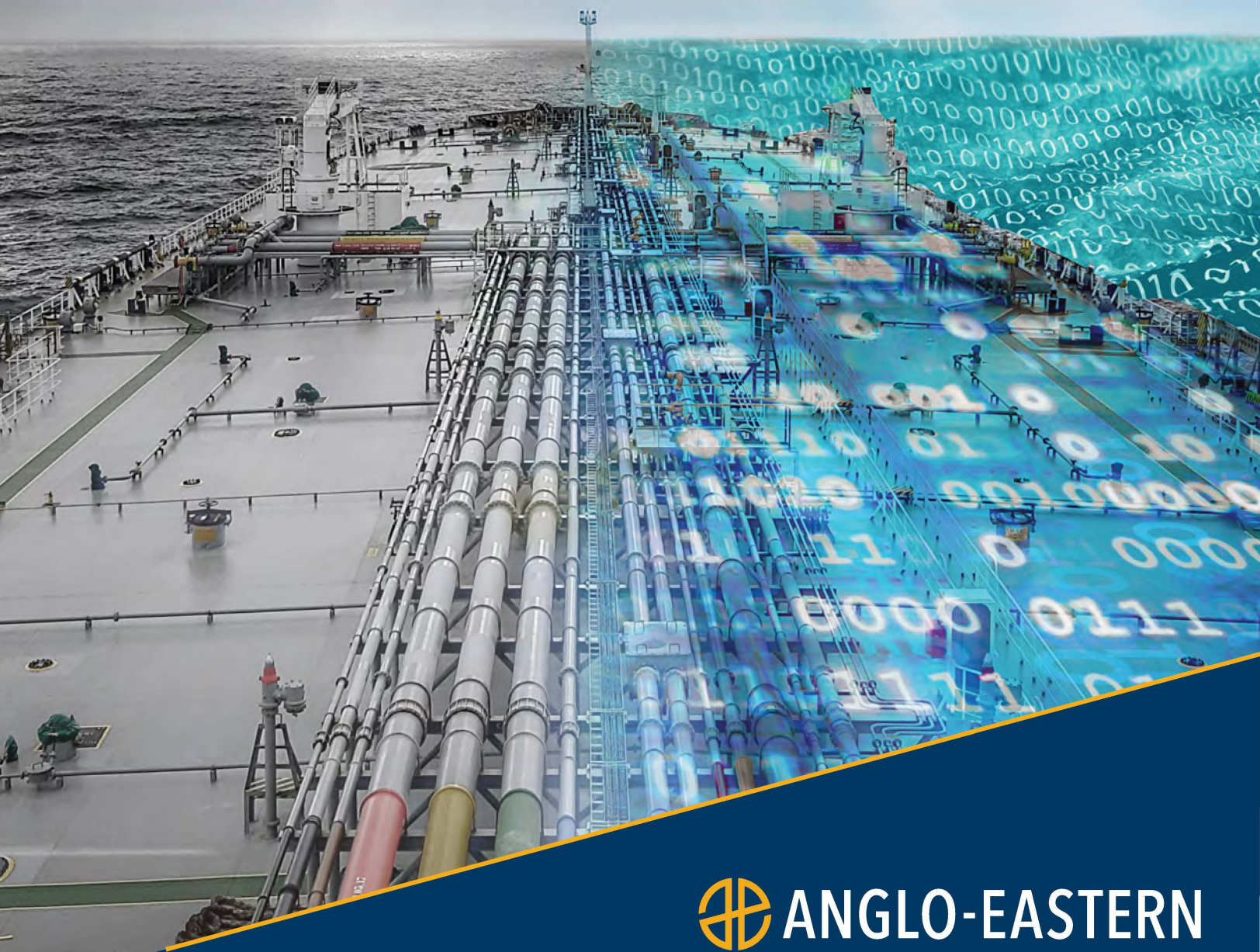


Digitalisation & data



A special report

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Digitalisation & Data

Shipping is coming to terms with its relationship with data, though a change of perception might be the easy bit; the questions about access, security and ownership call for stakeholder input from across the industry



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Education, not compulsion, will ignite digitalisation

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Published by Informa UK Ltd.

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Inmarsat Maritime's 'Digitalisation Uncovered' report identified three areas where digital applications would be focused.

Digital shipping moves to the next level

Digitalisation of processes was under discussion before Covid-19 struck, although there was a lack of urgency. Now, however, shipowners no longer ask tech companies about cost but about keeping ships running, **Richard Clayton reports**

All revolutions are messy. They begin as a reaction to a perceived need for transformation but end up as a disorderly transfer of influence from one elite to another.

The digital revolution in shipping is unlikely to be any different.

Nevertheless, it feels like a moment of change. The only question to be answered is whether this revolution contains a transforming event or not. If not, it's an evolutionary process.

Has the Covid-19 experience transformed what was a somewhat sluggish evolution of shipping's digital journey into a revolution with consequences throughout the maritime sector?

Will the acceptance of the need for digital solutions mark a watershed between shipping's past and future?

Shipping survived the revolutions

that saw the transition from sail to steam to diesel propulsion.

It is an industry trying to balance onboard pragmatism with strict rules and regulations. It has embraced the internet but struggled with the human-machine interface.

Now, one year after the arrival of the catastrophe of Covid-19, shipping seems to have understood that its future inevitably depends on its relationship with data.

First stirrings

Shipping's interaction with data-driven technologies preceded the coronavirus pandemic; Lloyd's List reported on the first stirrings of automation in 2013.

The internet of things (IoT), artificial intelligence, smart logistics and remote surveying were under discussion prior to lockdown.

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The digital journey is not a one-year process; the industry now recognises the need to see the big picture in order to see the detail.

The adoption of digital technologies was already under way, but there was no sense of urgency.

A snapshot of industry perception captured by Inmarsat Maritime in its timely ‘Digitalisation Uncovered’ report identified three areas where digital applications would be focused: fleet and vessel performance; navigation; and risk and safety management.

When asked how many digital solutions were already deployed on vessels and how many would be deployed within 24 months, survey respondents anticipated a significant uptake of applications by 2022.

Investment

A survey conducted in 2021 would likely see a leap in both the number of technologies embraced and the investment allocated.

“Working through the pandemic has demonstrated the true value of remote monitoring and cloud-based data,” says Antto Shemeikka, vice-president digital services at ABB Marine & Ports.

“This is not only to cut costs and aid decision-making but also to ensure that operations continue,” he explains.

“[Before Covid-19], shipowners did things in the traditional way: start small

“*[Shipping] is an industry trying to balance onboard pragmatism with strict rules and regulations. It has embraced the internet but struggled with the human-machine interface*”

and build. But in the new normal, there is no going back... I think digital solutions are here to stay.”

Mr Shemeikka outlines a change of tack. “The old question was: ‘What savings will we make? Show me the numbers.’ Now the question has become: ‘Can you ensure my asset’s operational capability remotely? How do we keep the ships running?’.”

Fortunately, satellite connectivity has moved ahead at pace.

Initially, connectivity was predominantly linked to crew welfare, comments Sven-Eric Brooks, senior director of business development at KVH Industries.

“In sectors such as chemical and parcel tankers or reefers, where a lot more cargo information is required, more technology is on board to monitor the cargo.

“People could already see the value of IoT and collecting shipboard data for multiple parties.

“It’s also a requirement of the cargo owners and often the insurance companies,” Mr Brooks says.

“For shortsea shipping, ferries and tugs, digital solutions don’t yet play much of a role, although they probably will in the future.”

The cost of connectivity or hardware is no longer an issue — continuing with limited access may have damaging consequences.

The discussion has moved on to more complex issues. Gathering data on vessel performance, navigation and safety management from multiple sources has evolved concerns of its own.

“The problem we have today is administration. There are so many different systems, they don’t work together,” observes Arild Risholm Sæther, head of business development for the Navfleet decision-support tool at Navtor in Norway.

“We have developed a single system that monitors how a vessel is performing against charterparty requirements and analyses how the hull, propeller or antifouling is performing.”

The system compares data over a specific route with the owner’s operational key performance indicators.

Navtor has worked closely with shipowners to fulfil their data analysis requirements within a single decision tool.

Recommendations highlighted by the analysis can be discussed with the vessel’s owner to provide an asset-focused operational and maintenance programme.

Eero Lehtovaara, head of regulatory affairs at ABB Marine & Ports, tells Lloyd’s List that another of the tricky questions is who gets access to what data.

“I’m sure we’ll never see all data being shared. There will be proprietary data that is not shared with anyone other than the contractual party.

“Some operational data will be shared under certain constraints — the arrival time of the vessel at the next port will be shared,” he says.

“We know that data from one of our pieces of equipment will need to be shared with the next component — but what data, what frequency, how will it be tagged?

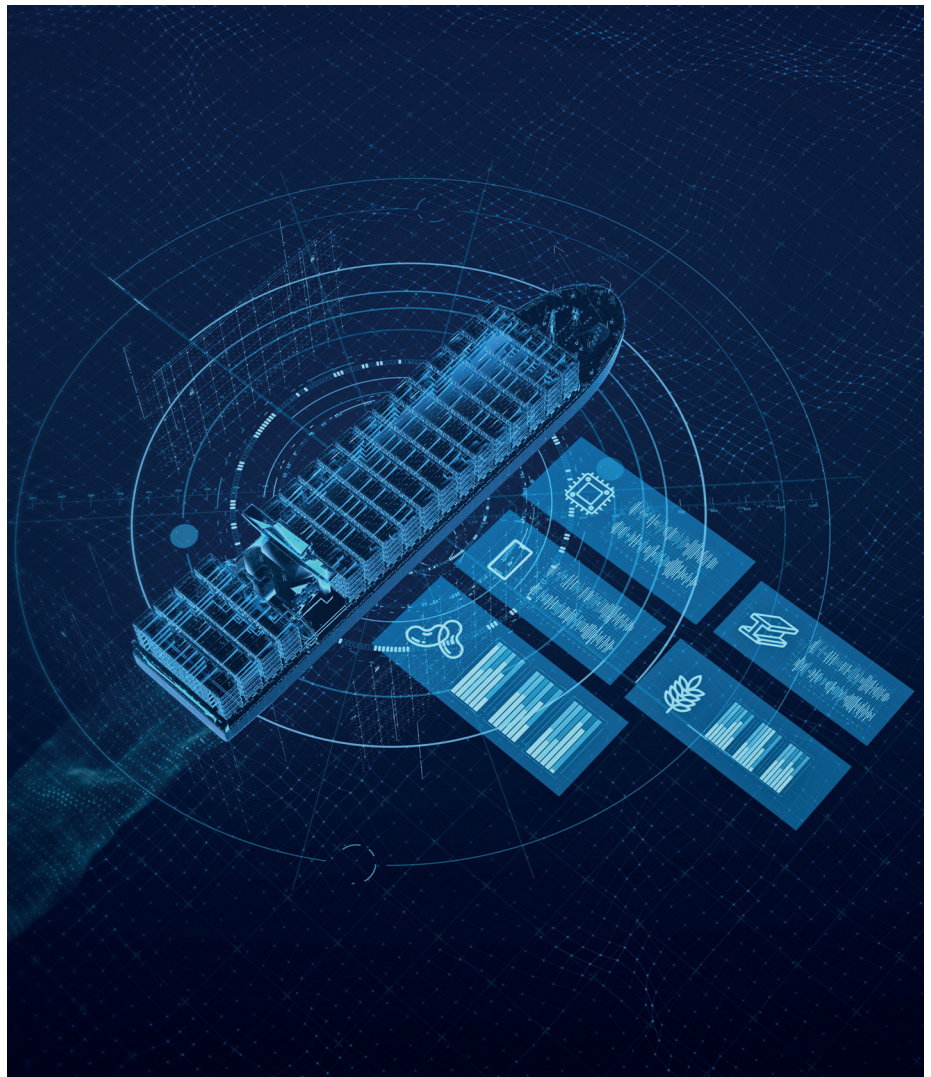
“Before we go into sharing data, we need to figure out why it needs to be shared, and to what purpose.”

Catalyst for revolution

Reimagining shipping’s relationship with data may be the catalyst for revolution or for an increased pace of evolution.

However, that data is driving deep discussions about access, security and ownership.

The solution to the dilemma of data lies in collaboration between all industry stakeholders, from owners and operators to charterers, class, insurers, equipment



Reimagining shipping’s relationship with data may be the catalyst for revolution or for an increased pace of evolution.

“*The solution to the dilemma of data lies in collaboration between all industry stakeholders, from owners and operators to charterers, class, insurers, equipment manufacturers, connectivity providers and, of course, regulators*”

manufacturers, connectivity providers and, of course, regulators.

Discussions are under way on various topics. However, the impetus is unlikely to be significant until all stakeholders believe their requirements are being observed.

The digital journey is not a one-year process, Mr Lehtovaara cautions; it’s at least 10 years.

“There are so many products that have to be tested incrementally. As with autonomy, systems need to be tested — and that takes time.

“One of the bottlenecks is seeing the ship as a system and seeing that system as a part of the logistics chain.

“As long as we look at bits and pieces, we don’t see the big picture,” he concludes.

Covid-19 has changed that perception. The industry now recognises the need to see the big picture in order to see the detail.

Container shipping's digital initiative bears fruit

The coronavirus pandemic has put liner shipping on the path to paperless documentation, Linton Nightingale reports

The Digital Container Shipping Association is approaching two years since inception. After an initial slow start, the initiative – set up to adopt digital standardisation in the industry – recently launched arguably its most significant standard to date, despite the backdrop of a global pandemic.

Although shipping has been labelled a technological laggard in comparison with other industries, container shipping has long been regarded as the sector paving the way towards a digital transition – or at least the one most visible, alongside the commercial cruise segment.

It was therefore of little surprise that it was the major container shipping players that were first in the industry to come together to form an alliance in early 2019 that would help spur digital standards.

Founding members Mediterranean Shipping Co, Hapag-Lloyd, Ocean Network Express and Maersk Line have since been joined by CMA CGM, Evergreen Line, Hyundai Merchant Marine, Yang Ming and ZIM, representing nine of the top 10 carriers and a membership of just over 70% of the total market.

The notable absentee remains China's Cosco Shipping, which the DCSA insists has an open invitation to join the party. Even so, with its publications readily available online, there is still nothing stopping Cosco from adhering to its standards.

The DCSA's leadership team comprises representation from each carrier in the form of their respective heads of IT, in an unprecedented union of the top lines accustomed to operating in digital silos.

Indeed, Matthew Wittemeier, marketing manager at logistics software developer Inform, said this consolidation of the major carriers has been the root of



Alex Koiokytas Photography/Shutterstock.com

Container shipping has long been regarded as the sector paving the way towards a digital transition.

its success, drawing on the same model adopted by the aviation industry in its own standardisation efforts.

“The International Civil Aviation Organization (ICAO) and International Air Transport Association (IATA) were an initial buy-in from every stakeholder. Similarly, all the container lines have agreed to adhere to standards from the get-go,” he tells Lloyd’s List.


Box blueprint

When the DCSA was formally announced, the organisation said it wanted to establish an industry blueprint for carriers

and IT developers that would encourage new services in the ocean shipping sector.

Speaking to Lloyd’s List at the time, Thomas Bagge, who joined from Maersk as chief executive and statutory director of the association, said members were seeking to bring container shipping together to establish standards from which the entire industry could benefit.

“This is essentially for the carriers to sit down and describe what the events are that take place on the shipping side, both operationally and on the documentation side, and to agree on the events that can be tracked,” he said.

A man wearing a blue t-shirt and a camouflage baseball cap is focused on working on a large, complex industrial machine. He is holding a tool or component of the machine. The background is a blurred industrial setting with various pipes and machinery.

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Fast-forward nearly two years and the DCSA has made significant progress, making good on its initial promise and aligning with the messages conveyed at its launch.

The DCSA's first landmark was achieved at the start of 2020, publishing its initial set of standards with the release of a common set of processes, and data and interface standards for track and trace services.

These can be implemented by carriers, shippers and third parties to enable cross-carrier shipment tracking using a common terminology for data and events.

The DCSA said this initial standard was one it felt it could get up and running quickly to further its credibility with something tangible before it could move onto the crucial documentation side.

Track and trace standards were followed last year by cyber-security guidance for the industry, as well as a new set of parameters for operational vessel schedules, which looked to add certainty and transparency to an issue that all too often has different meanings and terms for carriers and customers alike.

In 2020, the DCSA also released standards for 'smart containers' to exchange information, as one of three planned internet of things (IoT) standard releases addressing the connectivity requirements for reefer and dry containers, as well as the radio-frequency identification registration of containers.

The second release of its IoT standards initiative came in late December last year, for remote reefer container monitoring on board vessels.

The pace of the rollout of standards in 2020 was all the more impressive amid the backdrop of a global pandemic.

When the coronavirus crisis first emerged, there were concerns that the pace of container shipping's digital transition would slow and similarly the work of the DCSA be put on pause.

This did not prove to be the case.

Digital acceleration

SeaIntelligence Consulting chief executive Lars Jensen notes how this time last year, the general consensus was that container shipping was playing catch-up in the digitalisation race.

However, the pandemic proved that the level the industry had reached on digitalising significant parts of the supply chain was already quite far down the line.

"The world shut down during the pandemic, which forced all of the main container shipping lines to send more than half – and in some cases up to 70%–

“*It is hard to get nine competitors to agree on something at the best of times face to face – but virtually, it has become an even greater challenge*”



Thomas Bagge

Chief executive and statutory director
Digital Container Shipping Association

80% – of their staff home. Did the global supply chain stop moving? No, it actually kept on working quite well.”

There were also clear examples, he says, of how the industry was accelerating digitally and embracing digital tools, exemplified by the uptake ratios seen on both the online booking systems Maersk Spot and Hapag-Lloyd's Quick Quotes.

Furthermore, Mr Jensen adds that the pandemic made it abundantly clear of the specific places where there were manual stop gaps that had to be fixed.

"For example, the Indian government suddenly kicked into overdrive in approving digital customs documents because of major bottlenecks in the country," he says.

For the DCSA, the biggest change at the hands of the pandemic was the inability to hold face-to-face meetings. Whereas previously the member lines would convene on a six-week cycle in person, meetings now take place remotely.

"It is hard to get nine competitors to agree on something at the best of times face to face – but virtually, it has become an even greater challenge," Mr Bagge tells Lloyd's List.

Nevertheless, despite these restrictions, the DCSA managed to produce its most significant piece of work in 2020, taking the first steps of its eDocumentation initiative with the publication of the data and process standard for shipping instructions and bills of lading.

"Digitising documentation, starting with the bill of lading, is key to the simplification and digitalisation of global trade," Mr Bagge said when the standards were first published in late December.

The association hopes to facilitate adoption of an electronic bill of lading by regulators, banks and insurers and to unify communication between organisations and customers, carriers



and all other stakeholders involved in a transaction.

However, the initial plan was not to tackle electronic bills of lading until further down the line. The DCSA moved to fast-track standards when coronavirus drove home the message of the importance of paperless documentation.

"The pandemic made it clear we needed to speed up the process, so our advisory board made the decision in March [last year] that this was our most important topic and we had to put something together before the year was out," says Mr Bagge.

Mr Jensen agrees this was a core objective ticked by the DCSA.

"This goes to the very heart of the most important part of digitalising the entire supply chain," he says.

Although the industry has looked to deliver on this front in the past, with efforts stemming back nearly 20 years, these have – until now – failed to take off in any material sense, he explains.

"There are a number of reasons for this, standards being one of them. So, getting that one nailed and in place is an important piece of the puzzle solved," Mr Jensen says.

On the agenda

For 2021, the DCSA expects to roll out several new standards, including on just in time port calls, vessel loading practices, fuel optimisation and additional guidance on track and trace to further aid in the longstanding issue of cargo visibility.

However, as the DCSA continues with its objectives, it is down to the industry to follow its lead.

Mr Jensen points out that it is all very well agreeing on new standards; "that's the easy part".

As he goes on to explain, however, this has always been a two-step process.

“The next one is to get these implemented in the carrier’s back-end systems; that is the challenge,” he says.

The DCSA is also acutely aware that issuing standards will not facilitate change overnight.

“Adoption of standards must pick up pace to drive real change, and that requires carriers to not just work among themselves, but also with their partners and customers to replace antiquated, paper-based processes with a digital, standardised approach,” says Mr Bagge.

“It is imperative that shippers and BCOs know that digital standards are now available and, when widely adopted by carrier and other logistics participants, will improve shipment visibility and reliability.

“Carrier customers have an active role to play in driving standards adoption as much as the ocean carriers themselves. In the near term, the DCSA will be addressing ways to further facilitate adoption among those who will benefit the most from it.”

However, for Mr Bagge, the seeds have now been sown.

He said the biggest achievement of the DCSA so far is the change in mindset on data standardisation seen

“*It’s not surprising that digital standardisation efforts are catching the attention of other shipping sectors, as well as other modes of transport*”

across the industry. The level of co-operation among its members at its regular workshops is testament to this newfound approach and one the DCSA hopes to build on, he explains.

With data standards now in place, Mr Bagge hopes this will also encourage technology companies to offer solutions to the container shipping market, in which, in the past, it has been difficult to innovate and gain a foothold.

“It’s a big industry but there is a surprisingly small number of solutions. By harmonising some of the processes and data

standards, we can also open the door for a lot more technology and service providers to sell their solutions to the carriers.”

Mr Bagge reveals that the DCSA has already been approached by many enthusiastic solution providers looking for a piece of the container shipping pie.

Yet solution providers are not the only ones to have gauged an interest in the DCSA, with other shipping sectors also keeping a keen eye on its progress.

Although Mr Bagge does not disclose which segments or to what effect, he says they have maintained regular dialogue with the DCSA.

“It’s not surprising that digital standardisation efforts are catching the attention of other shipping sectors, as well as other modes of transport, because they share many of the same challenges and serve the same customers as container shipping.”

Whether the DCSA proves the catalyst for other sectors to adopt data standardisation measures remains to be seen. However, the association has certainly struck a chord and is shaping up to be a concrete example of how standardisation can be achieved within broader maritime circles.



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As homeworking and restricted travel become the norm, this will almost certainly permanently change the way business is conducted.

Shipping feels the loss of face-to-face contacts

Digitalisation and other technologies have enabled shipping companies to shift seamlessly to remote working, but bosses hope staff can be persuaded to return to the office once the pandemic recedes, **Janet Porter reports**

Winning new business. Negotiating freight rates. Recruiting staff. Checking out port facilities. Inspecting ships.

These are just a few of the activities that would have been considered routine prior to the Covid-19 pandemic, but are now very much more challenging as homeworking and restricted travel become the norm across the maritime industry.

This will almost certainly permanently change the way business is conducted in future.

In some respects, the shipping industry appears to have fared well, despite widespread lockdowns, with container lines in particular experiencing an extraordinary boom in late 2020 and early

2021 as government-imposed restrictions shifted spending patterns away from leisure activities to electronic goods, home improvements, domestic appliances and suchlike.

Flexibility has been the order of the day, as ro-ro specialist Grimaldi Group joint managing director Emanuele Grimaldi notes, with most employees working remotely over the past year.

However, this did not disrupt any of the group's activities, and had "no negative effect" on productivity, he tells Lloyd's List.

"On the contrary, our staff organisation reacted and adapted quickly to the new unprecedented situation," with the IT department rapidly setting up remote access for staff.



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Homeworking

That reflects the experience of many businesses. For the most part, technology has functioned well, with shipping company employees generally well equipped to work away from the office.

At CMA CGM, for example, the company’s already high degree of digitalisation enabled it to seamlessly set up homeworking for teams around the world within 48 hours.

Ironically, computer hacks that hit a number of prominent ocean carriers in recent years, including Maersk, were a wake-up call for the whole industry about the need for water-tight IT systems and robust business continuity arrangements.

That was certainly the case for Maersk Tankers, which was caught up in the cyber attack on the Danish group and had responded by drawing up contingency plans to ensure the company could continue to function in the event of some unforeseen disruption.

So when the pandemic forced offices to close, the tanker operator was well prepared, according to the head of human resources Prakash Thangachan.

Likewise, container shipping heavyweight Mediterranean Shipping Co says its pre-existing audited business continuity plans and disaster recovery plans across the organisation, including the deployment of remote working and shared service centres, were quickly implemented.

“Our response to Covid-19 has benefited from a combination of these pre-existing plans and our reactivity to this unexpected pandemic,” the company says.

Transatlantic specialist Independent Container Line was able to take advantage of the slump in volumes during the early weeks of the pandemic to equip all of its staff in Europe and the US with the technology and training to work remotely. That placed the carrier in a good position to cope with the subsequent cargo surge.

Nevertheless, the absence of regular face-to-face meetings between colleagues, and with customers, suppliers and other business associates, has thrown up many complications — some obvious ones and others less so.

Top management is acutely aware of the need to look after the well-being of staff, with many organising regular virtual social events, such as Friday night cocktails, quizzes or even an online orchestra. There are also more frequent video presentations from leadership teams to employees.

CMA CGM chief executive Rodolphe Saadé now addresses all staff on a weekly



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There are now more frequent video presentations from leadership teams to employees.

“*Top management is acutely aware of the need to look after the well-being of staff, with many organising regular virtual social events, such as Friday night cocktails, quizzes or even an online orchestra*”

basis, either through video messages or newsletters to update the workforce on both the Covid situation and group activities.

Among numerous initiatives, the French group’s CMA CGM Academy has provided all employees with e-learning courses and tips about homeworking.

The company also distributed masks in all of its offices, reorganised premises to accommodate social distancing measures and made Covid-19 testing available, including for seafarers to facilitate crew changes.

Other companies have also stepped up internal communication. At Maersk Tankers, the 450-strong workforce “could see what was happening in other industries, so it was important for us to reassure them that things were going OK”, says Mr Thangachan.

“So when our offices shut down, we increased the cadence of our town hall meetings from monthly or quarterly, to twice a week,” with the entire leadership team contributing.

Nevertheless, he acknowledges that some staff have found it harder than others to adapt to the new way of working, particularly those with young families in small apartments, or people living on their own.

Others agree.

“It is my impression that most companies, including Wrist Group, realised a bit late that some staff had challenges working remotely,” says Jens Holger Nielsen, chief executive of the world’s largest supplier of provisions and stores for those working at sea.

This was not so much a technology issue as the need for physical contact, camaraderie and to feel part of those informal networks that exist within offices.



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Pandemic positives

One feature of the pandemic has been the reluctance of shippers in the container sector to put business out for tender, according to ICL chief executive John Kirkland, instead choosing to remain with a familiar carrier who understands their requirements.

That trend has been noted by others as well.

In such an uncertain environment, “customers preferred to stay with their reliable suppliers — and this has become a big positive for us”, says Andrew Abbott, chief executive of Atlantic Container Line, which operates multipurpose ships in the transatlantic trades.

Yet the downside of customer loyalty has been the difficulty of attracting new business, especially when sales and marketing has to be conducted by video conferencing, email or phone, rather than face-to-face meetings that, in the past, have been so important in certain sectors of the shipping industry.

“It has become much more difficult to break into new business,” says Mr Abbott.

Mr Kirkland agrees that it is now far harder to reach new customers and to understand fully their supply chain needs when they are probably working from home.

Just as challenging is the preference of some shippers and forwarders to negotiate freight rates and other contract terms by email rather than phone, perhaps reflecting the fact many people are no longer able to conduct commercially sensitive calls in the relative privacy of an office, and instead may be at the kitchen table in a shared apartment.

Without the face-to-face meetings to discuss service agreements, there is concern in some quarters that container shipping will become more commoditised, despite efforts to move away from a purely price-driven business.

Nevertheless, Mr Abbott believes that customer communications have increased, now that less time is spent travelling — and more on phone calls and video conferencing.

“This means people are more reachable for more hours of the day,” he maintains.

However, no amount of technology can compensate for the usual due diligence during a personal visit when, for example, considering a new port of call.

“You can look at Google Earth all you want,” says Mr Kirkland, but that is no substitute for a close-up inspection of a terminal’s set-up, cranes and other equipment, which is extremely difficult with current travel restrictions.



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Face-to-face meetings have, in the past, been important in certain sectors of the industry.

“No amount of technology can compensate for the usual due diligence during a personal visit when, for example, considering a new port of call”



Much the same goes for chartering a new ship without a physical survey, however sophisticated drones may have become.

Fleet maintenance is also an issue. Grimaldi’s solution has been to relocate a technical team to Antwerp, where its ships call on a daily basis, in order to reduce travel from the group’s Naples headquarters.

Recruiting staff is another challenge, but one that can be overcome. Maersk Tankers says it has hired 75 new employees over the past year, with candidates sent laptops and interviews conducted virtually.

In future, “we will not be constrained by having to be physically present in the office”, Mr Thangachan predicts.

Digitalisation

Opinion is divided as to whether the pandemic has accelerated the introduction of digitalisation in an industry that is well behind many others.

Mr Grimaldi thinks it has, noting that “it is evident that we are heading towards a paperless business model”.

Mr Neilsen concurs, with Wrist intending to focus on more internal efficiencies through digitalisation and automation, while also seeing a greater willingness of customers to move ahead with digitalised processes.

Major trades are already highly digitalised, but many others still require paper documentation, which makes homeworking much more difficult. Those problems may be compounded by slow broadband speeds.

It remains to be seen whether the pandemic will hasten the move towards electronic bills of lading and letters of credit in smaller, less sophisticated shipping markets.

In such difficult times, however, many companies may be more concerned about managing their existing business models than introducing new systems, with modernisation “pushed to the back burner for now”, according to one top executive.

Yet whatever the future brings, one thing is clear. There will be no going back to the old ways when the Covid-19 crisis finally subsides.

Employers hope a move away from rigid office hours will help them achieve a more diverse workforce with a better gender balance, **Janet Porter** reports

In a highly sociable and globe-trotting industry, where personal relationships matter and there is usually a packed calendar of conferences, dinners, receptions and other networking functions, the past year has forced the shipping community to innovate, adapt and find new ways of staying in touch.

Even ship-namings, usually a great excuse for a party, have been forced to go virtual. When CMA CGM took delivery of its flagship LNG-fuelled *CMA CGM Jacques Saade*, the christening was a digital ceremony.

Yet while some events may return to a semblance of normality as the pandemic is brought under control, offices have probably changed forever.

There is a consensus across much of the business world that flexible working is here to stay, much as many are really missing face-to-face interaction with colleagues.

Most companies expect staff to find a balance between office and homeworking in future, with associated positives and negatives.

There is undoubtedly concern that younger people will miss out on the chance to broaden their horizons and career prospects by working in different departments, or taking a transfer abroad.

On the plus side, a move away from the straitjacket of nine-to-five hours is expected to benefit women in particular, including those who have to juggle the school run.

The hybrid model blending home and office working should help companies attract more diverse talent and promote inclusion agendas, says Maersk Tankers' head of human resources Prakash Thangachan.

The days when shipping executives, from senior to middle-ranking and junior, took a flight as frequently as most people hopped on a train or bus, would appear to be over for good.

"Virtual meetings will be the order of the day," predicts Wrist Group chief executive Jens Holger Nielsen.



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Most companies expect staff to find a balance between office and homeworking in future.

Flexible working to become the norm as companies accept office life has changed forever

He has found that, even for a meeting when some of the participants may be in the same building, it is still more efficient and effective for everyone to be online.

Also probably gone forever are the days when sales people spent much of their time on the road, visiting clients,

"We expect face-to-face meetings with customers to reduce or even stop altogether," said one top executive.

Grimaldi Group joint managing director Emanuele Grimaldi agrees that video-conferencing has become very efficient, such that business travel is likely to be greatly reduced in future, with the bonus of a significant reduction in expenses.

With fewer people on site at any one time, and the need for space to be reconfigured to accommodate social distancing, the office of the future is likely to look very different from the banks of desks and staff working at very close quarters to each other, which had become the norm in recent years.

"The pandemic and lockdowns have highlighted the importance of finding the right balance between remote working and an onsite presence, both for employees' well-being and working effectively as a team," says CMA CGM.

"Because our working habits will be different after the crisis, we are already working on what will be tomorrow's office, and how we can change the way we work and interact with one another."

Yet it remains unclear at this stage whether companies plan to reduce floor space, given that staff are only likely to be in the office two or three days a week in future as flexible working becomes standard.

Equally uncertain is how these new working practices and increased digitalisation and automation will affect headcounts in the months and years ahead, once the immediate crisis is over and leadership teams have a chance to properly assess their future human resource requirements.

Digitalisation Uncovered

Informa Engage, on behalf of Inmarsat, surveyed more than 350 shipowners and shipmanagers on the progress of digital adoption in the shipping industry, and what lies ahead amid a period of technology transition

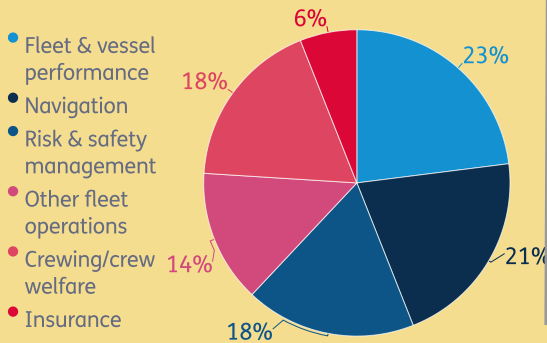


Digital deployment

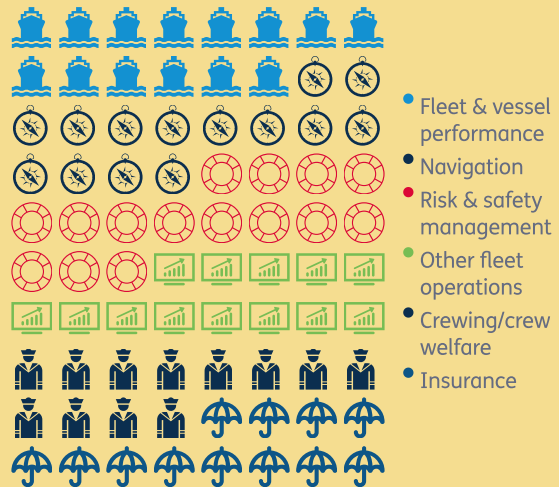


In which areas is your organisation presently testing/deploying digital applications, or planning to deploy in the future?

Present: Deployed/testing

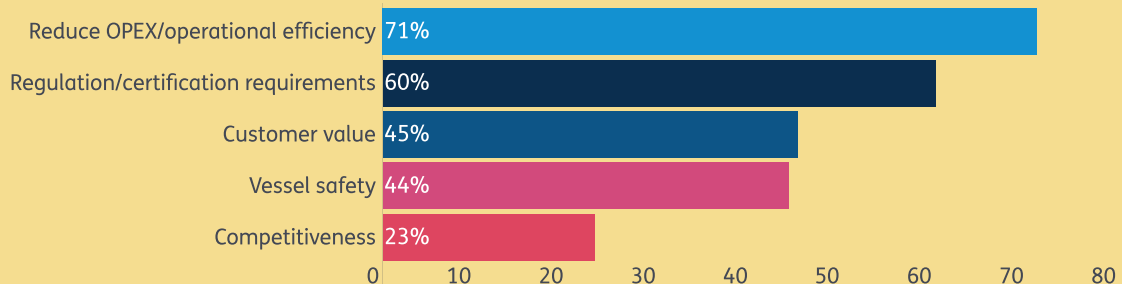


Future: Digital application spread



Key drivers

Top five motives for digital adoption*



*Percentage of respondents who named each motive as one of the top three reasons for digital adoption



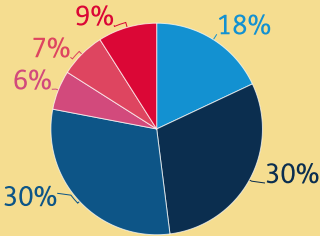
"We try to put ourselves at the forefront of technology, and we are not afraid to share information. You have to get past that hurdle."

Stena Bulk chief executive Eric Hånell



Cost savings

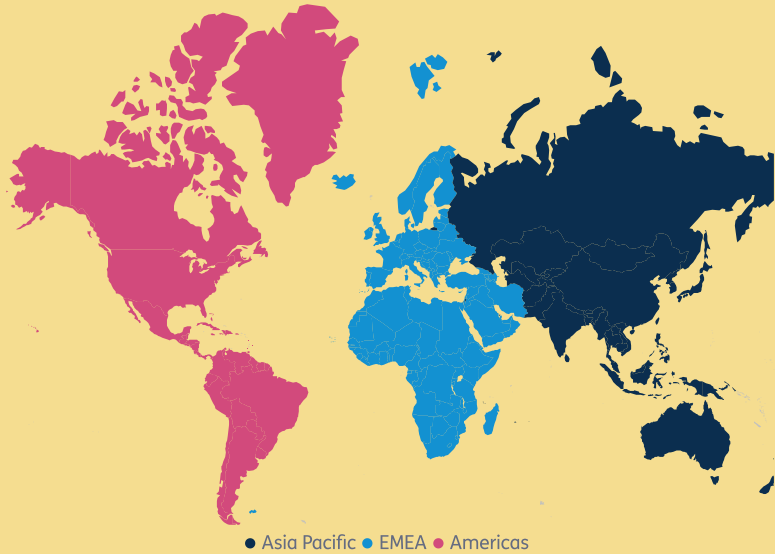
How much are you expecting to save in operating costs over the next 12 months from the adoption of digital solutions?



- 1% - 4%
- 5% - 9%
- 10% - 19%
- 20% - 29%
- 30% or more
- None

Operational headquarters

Regional breakdown of shipowner/shipmanager respondents' company headquarters



48% of respondents said their organisation is either very likely or likely to work with an early stage/scale-up company for digital solutions in the next 12 months



"Developments in wider society mean there is no going back for the maritime industries' digital revolution"

Inmarsat Maritime president Ronald Spithout

Source: Informa Engage, Inmarsat

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Digital capabilities must be at the heart of shipowners' and managers' strategy

Managers should plan 'next step' digitalisation, ahead of greater scrutiny of shipping by end-users

The Covid-19 pandemic has already demonstrated the necessity of digital platforms for communication and collaboration in shipmanagement.

Business and consumer platforms have been successfully used to support crew welfare, conduct remote inspections and provide remote assistance — technological advancements in recent years have enabled the industry to navigate the storm far better than it would have a decade ago.

Simultaneously, the pandemic has increased maritime's profile, through seafarers' plight stuck on board and, more recently, logistics bottlenecks in key ports, affecting supply of goods and services.

As understanding of how ships support the world economy increases, so will the influence and demands of end-users. The maritime industry can expect more scrutiny on optimisation, and with that comes a necessity to digitalise and leverage data.

Anglo-Eastern believes that to keep at the forefront of the industry, it is essential for shipowners and shipmanagers to place their digital capabilities at the heart of their strategy, to unlock the opportunities presented by closer collaboration and optimisation between the teams on board, those ashore and with the client teams they serve.

In order to achieve its goals, Anglo-Eastern is implementing an integrated system that provides shore management teams and shipowners with instant, real-time access to information, from vessel location and voyage information to financial and procurement details, maintenance status and operational performance.

This is provided on user-friendly interfaces backed by cloud-based systems. The data ecosystem is digitally connected within the ship, and the ecosystem plugged into 'the cloud'. That cloud ensures a single version



Anglo-Eastern's Fleet Operations Centre, where vessels' information and data is analysed.

of the 'truth' available on board, in the ship manager's office and with the shipowner, in real time. It lifts the 'veil' that exists today between ship and shore and shipmanager and owner, ensuring transparency.

Another key aspect of the digital future of shipmanagement is the ability to use data to optimise performance, whether to support crew welfare, improve operational efficiencies, enhance safety, or advance decision-making. Leveraging digital solutions has shifted from being a luxury to a necessity for business competitiveness and success.

Anglo-Eastern's integrated system allows it to slice and dice data across its fleet, and automatically build models for individual ships' voyage and fuel optimisation.

Ships also have to be ready for digitalisation, requiring cybersecure infrastructure on board with bandwidth capability to share data with shore.

'Tech' companies are already prepared, offering Low-Earth Orbit Satellite technology that will bring affordable, high-speed internet coverage globally.

Also needed is shoreside hardware capable of exploiting ships' data. Anglo-Eastern has a dedicated Fleet Operations Centre with latest technology, to review and compare different data sets, all linked into videoconferencing capabilities.

This room doubles as an emergency response centre in which an emergency team can convene to handle any situation, with the capability to interpret all applicable data across a single system.

Digital transformation of shipmanagement is already in progress, but it is important to look to the next steps.

Today's moves are paving the way to a point where voyage planning on board takes into account not just safe passage, weather, tide and speed, but also a myriad of other contributing factors: berth and cargo availability, optimised maintenance timing, crew change timing, flight availability and costs etc. Each actor and decision influences the next, but the optimum solution is generated by a computer capable of assimilating all the variables.

As we have seen in other industries such as aviation, oil and gas and vehicle manufacturing, use of data and artificial intelligence will play an increasing role in driving shipping's economic value and efficiency, and its interaction with other sectors. Now is the time for all players to make sure they are willing and able to take up the challenge and be ready for the digital future of shipping.

Sponsored by Anglo-Eastern



DNV GL

Data from remote surveys could be fed into AI systems to monitor ships in real time.

Remote possibilities: Covid pushes surveys online

Remote surveys have helped clear the backlog of ship inspections delayed due to the pandemic; but once it is over, can class societies convince shipowners to keep up the pace of change? **Declan Bush reports**

Just as the world's office workers have spent the year getting to grips with working remotely, so too have maritime surveyors. What they have found in the process gives a glimpse of what the digitalisation of shipping may look like.

DNV GL, which started remote surveys for some simpler jobs in 2018, has gone from performing about 35 a day pre-pandemic to about 60 now.

Lloyd's Register says at least one-third of its jobs are now done remotely, up from 15%-20% of the roughly 30,000 jobs a day it handles around the world. The advent of live-streaming video has made more complex jobs possible remotely.

Bureau Veritas had opened eight remote service centres by June last year and estimates it has performed 3,000 remote surveys "fully online" using live streaming.

ABS says demand has surged, and not just because of the pandemic.

"This was always destined to become a routine operation and we are well past the tipping point of market acceptance," says John McDonald, its senior vice-

president for global business development.

Remote surveys have helped inspectors get around coronavirus travel curbs. They also cut down on travel costs and carbon emissions and can make survey timing more flexible.

Live-streaming lets the surveyor direct the camera to check anything they are unsure of – a big improvement on using recorded videos supplied by the crew. Image quality by drone has impressed surveyors wary of relying on two senses instead of their usual six.

However, there are drawbacks.

"Our whole regulatory model is built around physically attending," says James Forsdyke, head of product management at Lloyd's Register.

Since the International Maritime Organization's rules assume someone is there in person, remote processes must try to emulate this – a process he says is self-limiting.

"You can live stream to as high a quality as you can... but at best, you're always going to be almost as time-efficient as when the surveyor is on board," Mr Forsdyke says.

Connectivity can be a problem. Some vessels lack enough computers, cameras or local SIM cards with 4G signal.

Others have had to get creative with portable routers.

“What you see is what the person holding the camera is showing you,” adds Stener Stenersen, head of DNV GL’s technical support department.

“You don’t have this peripheral vision.”

Planning and performing remote surveys also takes crew members away from their other jobs, he adds.

Mr Forsdyke says a normal annual survey on an average cargoship would take two people about 12 hours.

“To do that remotely, you need at least a day of preparation, and you need probably two to three days of multiple live-streaming interventions,” he says.

This only makes business sense if a survey cannot be done in person or postponed. Costs may fall over time, but after Covid, these will probably return to normal.

Class societies have been cautious towards remote surveys and none are seeking to do away with in-person surveys soon, especially annual surveys. They say remote surveys are best saved for irregular or minor checks, though the range of remote jobs will keep growing.

Writing in Lloyd’s List, DNV GL maritime chief executive Knut Orbeck-Nilssen said: “Where the percentages eventually settle is less important than achieving the optimal application of both methods, ensuring both thoroughness and efficiency.”

Yet there is still an opportunity to harvest the data gathered in the process to help build more digital tools, such as real-time monitoring and optimisation software.

Mr Forsdyke says surveyors could save hours spent reviewing paperwork with the captain by having artificial intelligence verify uploaded documents, the way banks have automated mortgage applications.

Having a verified “digital twin” of the ship could one day reduce the need for some physical checks. A customer could have on-demand confirmation of a ship’s material state, instead of relying on the certificate from its last inspection and hoping nothing has gone wrong since.

Such an ability would be “transformative”, Mr Forsdyke says.

Mr Stenersen says there is potential to use video feeds to train AI to spot cracks or other problems. He says the systems needed to collect and process all this new data are not there yet, but the future looks promising.



Igor Kardasov/Shutterstock.com

Class societies have been cautious towards remote surveys and none are seeking to do away with in-person surveys soon, especially annual surveys.

“*Surveyors could save hours spent reviewing paperwork with the captain by having artificial intelligence verify uploaded documents, the way banks have automated mortgage applications*”

Laurent Hentges, marine and offshore vic-president for operational excellence at Bureau Veritas, says BV is working on AI tools for tasks like spotting corrosion.

Mr McDonald, at ABS, hopes technology will free surveyors and crew alike to focus on the important safety work while the machines crunch data.

“By augmenting the process in this way, we can safely transition to the world we know is coming,” he says.

Such a world may see more remote operations and inspection processes, “but we will still need intelligent, experienced humans to interpret them”.

It is uncertain how many remote processes will outlast the pandemic. Shipowners are reluctant to commit to shiny new technologies without a compelling business reason to do so.

Mr Forsdyke says the challenge for class societies will be in adapting business models to make the best use of technology.

“There are so many opportunities to change. But any change we make has to be for a reason that moves us forward and is not just a show and tell of what technology can do.”

However, he is “incredibly grateful” that shipping had the technology in time for the virus.

“If this pandemic had hit us five years earlier, the impact on shipping would have been much worse,” he says.

Mr Stenersen says shipping will not return to pre-Covid times: “The change has come; customers are used to working remotely with us.”



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Container and cruise companies are seen putting more efforts into safeguarding their operations compared to other shipping segments.

Shipping takes first collective cyber security steps in 2021

P&I and classification society leaders talk about the impact of IMO 2021 and the state of the shipping industry against cyber security threats, **Anastassios Adamopoulos** reports

The year is 2021. Shipping is targeting zero-emission ships, aspiring for autonomous vessels and, like every other industry, is mostly working from home.

Yet when it comes to cyber security, the maritime industry as whole is still seen as a child taking its first steps.

Just a few weeks into implementation of the International Maritime Organization’s 2021 cyber security rules, the sector has embarked on its early collective process of protecting itself.

“Shipping is at the start of its cyber risk management journey. The basics have to be there,” North P&I Club loss prevention director Colin Gillespie says.

The basics are, indeed, now there, as rules and guidelines offered by the IMO, the biggest industry associations, as well

as various leading classification societies have collectively set the mould for what the minimum expectations are from a company – not just shipowners – in the maritime sector.

The IMO 2021 resolution, in particular, has been viewed by some as a watershed moment for the sector. It asks shipowners and managers to implement cyber risk management into vessel safety management systems by the time of their first document of compliance audit in 2021.

“The biggest benefit of the cyber IMO 2021 resolution is that it increases the awareness of cyber security,” says DNV GL group leader for cyber safety and security Jarle Blomhoff.

“It forces every company to consider the risks – and it forces them to start working on it.”

Most companies have begun implementing cyber security into their ISM and they are working on being better at cyber security, according to Mr Blomhoff — though if really scrutinised, one would likely find shortcomings in all companies.

“However, the ISM is built up around continuous improvement and most companies have now started that journey to build cyber resilience into their safety management system,” he says.

The sources of threats against shipping companies’ onshore operations are familiar; emails, fake calls and viruses are some of them.

On the vessel itself, while improper use of USB drives and emails are still causes for concern, Mr Blomhoff notes that the poor segregation of systems on board can also cause harm to the ship’s control operations. This becomes especially important given the broader push to digitalise operations.

Major and highly publicised cyber security breaches seen in shipping over the past couple years, namely those against Maersk and CMA CGM, have alerted those who have been — willingly or not — oblivious to the cyber risks to which shipping companies are susceptible, as well as to the possible damage.

Mr Gillespie agrees that high-profile cyber security incidents and regulatory efforts have led to a stark increase in awareness over the four to five years he has been dealing with cyber risk, to the point that he believes it is now almost universal.

“There aren’t really any companies out there that don’t know they have to manage [the risk],” he says.

IMO 2021 will act as a useful floor for the minimum expectations from the industry. As in most areas, the variance in the action actually taken will be great — especially now.

Budgets, experience, culture, the perceived levels of threat and the degree of sophistication in both IT systems and connectedness of command and control systems on board vessels will be key drivers in these disparities.

Mr Blomhoff observes that IT infrastructure in offices of shipping companies is similar to other industries, whereas the IT systems are not as modern and their control systems are immature when it comes to cyber security.

That is changing, even if the levels of action differ significantly case by case.

Container and cruise companies are seen putting more efforts into safeguarding their operations compared to other shipping segments, because they



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Cyber security is not defined by rigid threats that can be dealt with by specific remedies.

are considered more attractive cyber-attack targets.

The IMO 2021 resolution offers little detail on the specific action that companies should take to protect themselves.

Maritime regulation has proved effective in protecting lives, changing behaviours and overall improving this business on the back of both safety-based initiatives and environmentally focused policies.

Yet cyber security is not defined by rigid threats that can be dealt with by a set of very specific remedies.

“It is very difficult to give detailed guidance because every company’s set-up is different and the threat picture changes quite quickly,” Mr Gillespie says.

That makes it very difficult for the authorities or anybody setting guidelines to give anything more than a framework that companies can use and adapt to their operation.

Mr Blomhoff also notes that cyber regulation has to be adapted to different segments and vessel complexities.

“However, everyone should build a minimum level of compliance and security barriers,” he says.

If regulations can only go so far in affecting change, they can help set expectations and the potential financial fall-out in the future may depend on them.

Mr Gillespie says at the moment, cyber security-related claims are practically non-existent from a P&I perspective.

The potential, though, is there and there are systemic risks with which insurers would be concerned, such as certain equipment being hacked and subsequent claims.

Augmented awareness, more rules and the potential proliferation of threats also mean more responsibility for shipping companies and perhaps less room in the future for understanding and insurance coverage.

The fact that cyber is being seen as a developing risk and a threat that could catch anyone off guard has cultivated a greater level of tolerance, according to Mr Gillespie.

That may dissipate as regulation kicks in and there is a base level of compliance that is expected.

“The more regulations are in place and the more companies are expected to manage these risks, the less tolerance we might see for payments,” he says.



Rolls-Royce Holdings

Data whizzes are winners in next phase of digitalisation

The path to autonomous shipping is seen as a step-change process.

Access to information and data and what is done with it will determine the winners and losers in the race to the next phase of digitalisation, **Vincent Wee** reports

One of the key differentiators of the users of technology in shipping is the access to information and data and what is done with it. To a large extent, this draws the line; it is what could potentially be the bridge between the current and next phases of digitalisation in shipping.

On one hand is the so-called low-hanging fruit, or the more easy-to-access technology that has seen some adoption because it quickly delivers benefits such as cost-savings, access to new trading opportunities or greater convenience and efficiency. This includes trading platforms,

cloud-based services, apps-based solutions on mobile devices and covers the range of maritime activities from container shipping to procurement and pilotage services to bunkering.

Meanwhile, the next phase will see the integration and application of more disruptive technologies, such as data integration and analytics and increasing use of automation and autonomous operations.

Many conversations with start-ups and industry players now revolve around integration.

One of the main by-products of the digital revolution in shipping is the generation of huge amounts of data, from engine performance to weather and speed.

The question is what to do with it – and this is the crux of the challenge facing shipping in the next phase of digitalisation.

“Once an industry tackles the digital information barrier, the next opportunity it looks to solve is how to obtain actionable insights with the data, as too much data leads to information overload and fatigue,” says Shaun Hon, director of tech accelerator Rainmaking Transport.



“Once an industry tackles the digital information barrier, the next opportunity it looks to solve is how to obtain actionable insights with the data, as too much data leads to information overload and fatigue”

Shaun Hon
Director
Rainmaking Transport

Giving an indication as to where these opportunities might lie, he tells Lloyd's List: "As supply chains become more data-driven, we will need algorithms to help filter the right data to look at and optimise an outcome that we would like."

Anglo-Eastern Ship Management QHSE and training group managing director Pradeep Chawla goes so far as to say the next test of the best shipmanagers will be who goes about the process of digitalisation the best.

"The industry is now just past the hurdle of collecting data and is in the phase of making sense of that data," he says.

For example, he notes that Anglo-Eastern's fleet optimisation system from Wärtsilä already has 364 of its ships on it and the process of bringing the whole fleet on board will continue.

"Combining different data points, we can apply machine learning to make sense of the huge amounts of data coming ashore," Capt Chawla says, adding that he sees this trend increasing rapidly in the next five to seven years.

Another major trend for the future is automation. This applies to multiple aspects of the shipping industry, from the supply chain to autonomous vehicles and vessels.

Coming from his perspective as the founder of Plug and Play Supply Chain at another tech accelerator and venture fund, Plug and Play Tech Center, Mike Zayonc gives the example of TuSimple, a company in which UPS has a stake.

This company is developing a network of routes for autonomous trucks in the US, as well as another start-up, Autobon.ai, which is using AI-powered hardware in tractor-trailers.

One Sea ecosystem lead Paivi Haikkola cited developments in South Korea and Japan as being very encouraging, with the former's Won160bn

“From One Sea’s point of view, it is a step-wise process and we will see these technologies coming into use step by step”

Paivi Haikkola
Ecosystem lead
One Sea



“Combining different data points, we can apply machine learning to make sense of the huge amounts of data coming ashore”

Pradeep Chawla
Managing director of QHSE and training
Anglo-Eastern Ship Management

(\$130m) in government investments to boost the domestic eco-friendly and smart-shipping industry. Its goal of achieving a 50% global market share by 2030 is particularly ambitious.

Ms Haikkola says, however, that automation in shipping should not be looked at as a jump straight into unmanned vessels, as there is a whole range of applications in between — some of which are already well on their way.

"From One Sea's point of view, it is a step-wise process and we will see these technologies coming into use step by step," she said.

This ranges from proven technologies, such as remote engine monitoring and other sensor equipment, to anti-collision and remote navigation systems. Each will build upon the other to gradually lead to more automation on board.

There is a vast range of operating profiles and ship types, from simple coastal ro-ros to oceangoing ultra large container vessels, Ms Haikkola says.

"We always start from the basis of meeting transportation needs and solutions will be different but we are going to see automation in all of these, just with different kinds of solutions."



Anglo-Eastern's Capt Chawla agrees and ventures that while the first phase of automation on ships will take place within the next five to 10 years, it will be at least 30 years before we see fully autonomous vessels with no crew on board.

What he calls the level 1 unmanned bridge will apply to vessels sailing more than 200nm from shore and, at the outset, will include applications such as anti-collision systems and autonomous navigation. Only when these are proven and there is sufficient confidence in them will automation on board progress.

This is echoed by ABB Marine & Ports global programme manager for intelligent shipping Kalevi Tervo.

"We already have examples of commercial applications of augmented reality and AI to improve the situational awareness of the ship crew in terms of navigational safety," he says.

Yet while vessels operating in national waters will progress faster towards a higher level of automation, Mr Tervo says the same trend is not being seen in the short term in international oceangoing shipping.

"In these vessels, we see the gradual development towards assisting technologies and semi-automated functionalities, where the human is actively in the loop, but the systems will help in making better decisions and more accurate control of the vessel," he notes.

Mr Tervo predicts that in both international and national vessels, the improved connectivity will gradually enable more decisions, planning and management on shore, making the landside crew more integral than the role of those on board the vessel.

"The shipping industry does not need disruption — it needs a thoughtful approach to adopt new solutions if we truly want to advance the industry as a whole," Rainmaking Transport's Mr Hon stresses.

Education, not compulsion, will ignite digitalisation

Understanding the needs of the industry and seeking the right digital tool will have much more impact than expecting shipping to invest unwillingly, **Richard Clayton** reports

Shipping’s digital journey must involve a degree of education – both from shipowners and operators and from technology businesses – believes Sean Fernback, president of Wärtsilä Marine Voyage. The reason is clear.

On a number of occasions during the first few months in his position, he heard it said that technology companies were “trying to ram ‘digital’ as a product or a methodology down the throats of our customers when they don’t understand it”, he tells Lloyd’s List.

He believes tech companies such as Wärtsilä should help the industry to understand what problems they have that can be resolved using digital solutions. For issues involving fleet optimisation, vessel operations, or data analytics, it is the best way forward.

Mr Fernback suggests the widely used



Tech companies such as Wärtsilä should help the industry to understand what problems they have that can be resolved using digital solutions.

expression “digital transformation of marine” misses the point.

The focus should be less on how shipping can be transformed through digitalisation, and more on how digital tech can enable technology businesses to work alongside shipping to tackle practical problems.

“Some of our bigger customers in the cruise and container sectors are progressive in their thinking. They have brought together the digital skills they think they need,” he says.

However, not enough companies have progressed that far.

Other companies have taken a different

approach. They acknowledge the need to do something in digital and have hired a really good digital guy.

“It’s an odd way to look at it,” Mr Fernback acknowledges.

“That digital guy might not be used to the maritime world. It’s not as straightforward in shipping as writing software at Amazon.”

There have been casualties. Good digital experts have come but quickly departed, “frustrated by the commercial inertia of marine”.

It is important to understanding and respect the pace of change in shipping, making sure technology businesses come up with the right solutions at the right time.

“There’s nothing worse than creating the most fantastic product, only to find the industry is not ready to take it on board.”

It is not only shipping companies that are holding back the industry’s progress. Wärtsilä has spent time and effort in getting flag states to allow new pieces of technology to be installed on board a ship.

“One of our greatest barriers in terms of being able to progress is moving the industry from a focus on compliance to be more adoptive of solutions.

“We’d like to see a different cadence when it comes to getting approval from flag states or the IMO [International Maritime Organization].”

“There’s nothing worse than creating the most fantastic product, only to find the industry is not ready to take it on board”

Sean Fernback
President
Wärtsilä Marine Voyage



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Satakunta University of Applied Sciences (SAMK) via Wärtsilä Marine Voyage

Wärtsilä has taken a stepped approach to autonomous shipping.

Mr Fernback recognises companies in the digital space are struggling to create the right perception for potential customers.

“Wärtsilä is still seen as an engine and propulsion company. What’s overlooked is that we have 1,800 people working on cutting-edge technology to solve specific problems and deliver particular benefits.

“We’re not getting that message through,” he admits.

“It’s partly us and partly a hesitation among shipowners. There are the early adopters and there are followers who want to be shown it is proven, stable, mature technology. They want to know the safety record and pricing.”

The push for autonomy in shipping might have brought a degree of confusion, Mr Fernback believes.

Perhaps technology experts are trying to force the technology at too early a stage.

His previous experience offers some insight.

“Five years ago, I was involved in the automotive sector, when the talk was all about self-driving cars.

“It was all going to happen within three years — then it was realised it’s much harder than they had thought and the customer was not ready to take it.

“*We don’t talk about the autonomous ship because nobody knows when it will happen and what types of vessel will be autonomous. However, there are certain solutions we can deliver that can take a vessel towards autonomy*”

“A different approach was needed in automotive — and that’s been good learning for us.”

Wärtsilä has taken a stepped approach to autonomous shipping.

“We don’t talk about the autonomous ship because nobody knows when it will happen and what types of vessel will be autonomous.

“However, there are certain solutions

we can deliver that can take a vessel towards autonomy.”

He gives the example of replacing a human bow lookout with a digital solution, which would mean a container ship stacking more containers.

It is both better utilisation of the ship’s design and capacity and forms a component in the journey to autonomy.

Another example would be the periodically unmanned bridge, which allows the night watchman to leave the bridge to be ‘manned’ by technology.

These are stepping-stones in a progressive approach that allows customers to get comfortable, he says.

“That way, we’ll get greater adoption, and greater education in the industry.”

Satellite communications technology has come a long way in the past 10 years. In terms of bandwidth and coverage, Mr Fernback confirms it is pretty good, with wider coverage and affordability.

Digitalisation must include a stronger element of education, he concludes.

“We all have to take a role in education, using the right language that allows shipowners and operators to think laterally.

“They must feel comfortable sharing their problems so we can provide the right solutions for them.”



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