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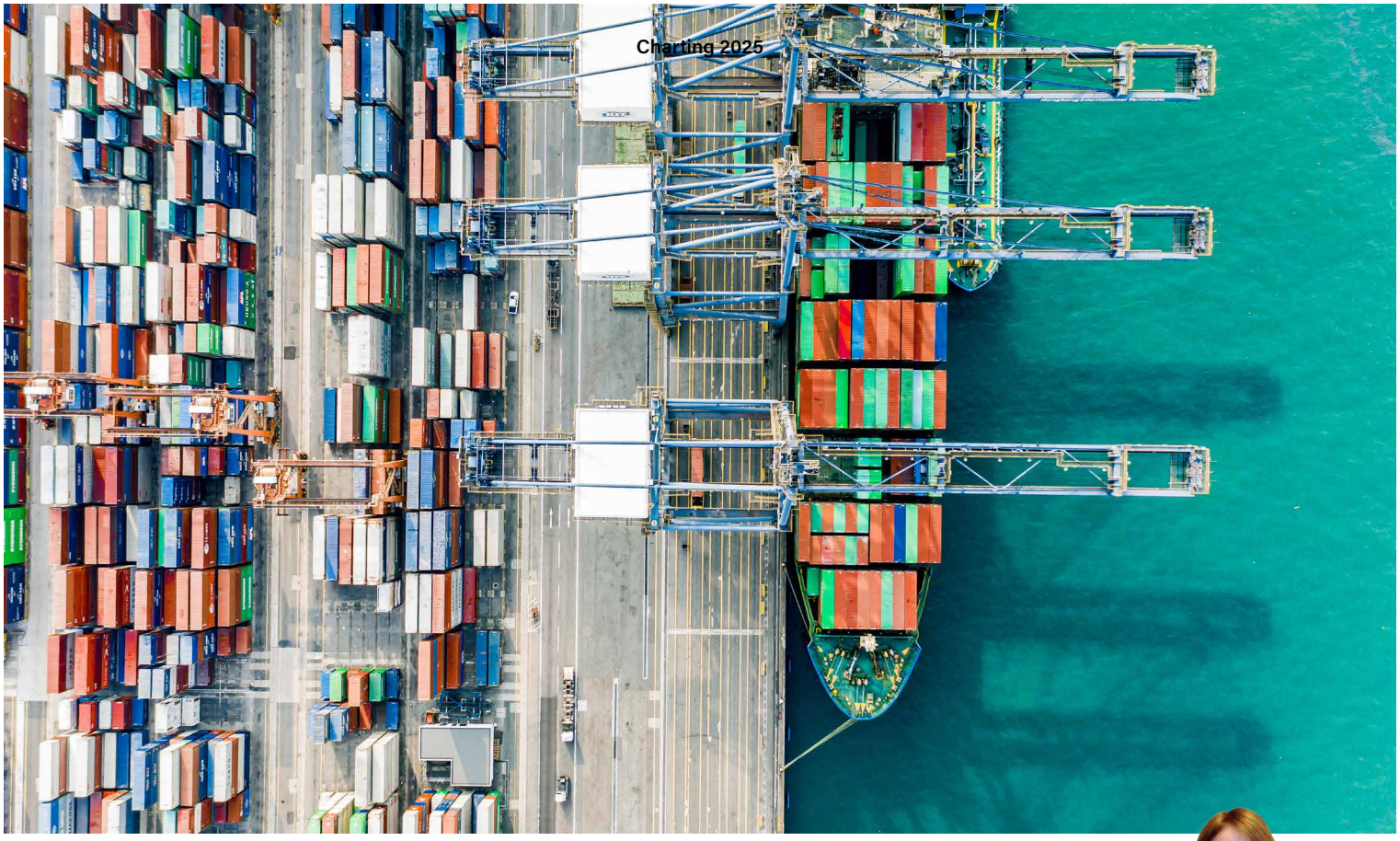


FROM THE EDITOR

Margherita Bruno,
Editor

Hello and welcome to the 146th edition of our maritime journal! As we approach the end of the year, it's the perfect time to pause, reflect on 2024, and look forward to what 2025 has in store. This is our final issue of the year, and we've packed it with insights that touch on both the significant achievements of the past year and the exciting innovations on the horizon.

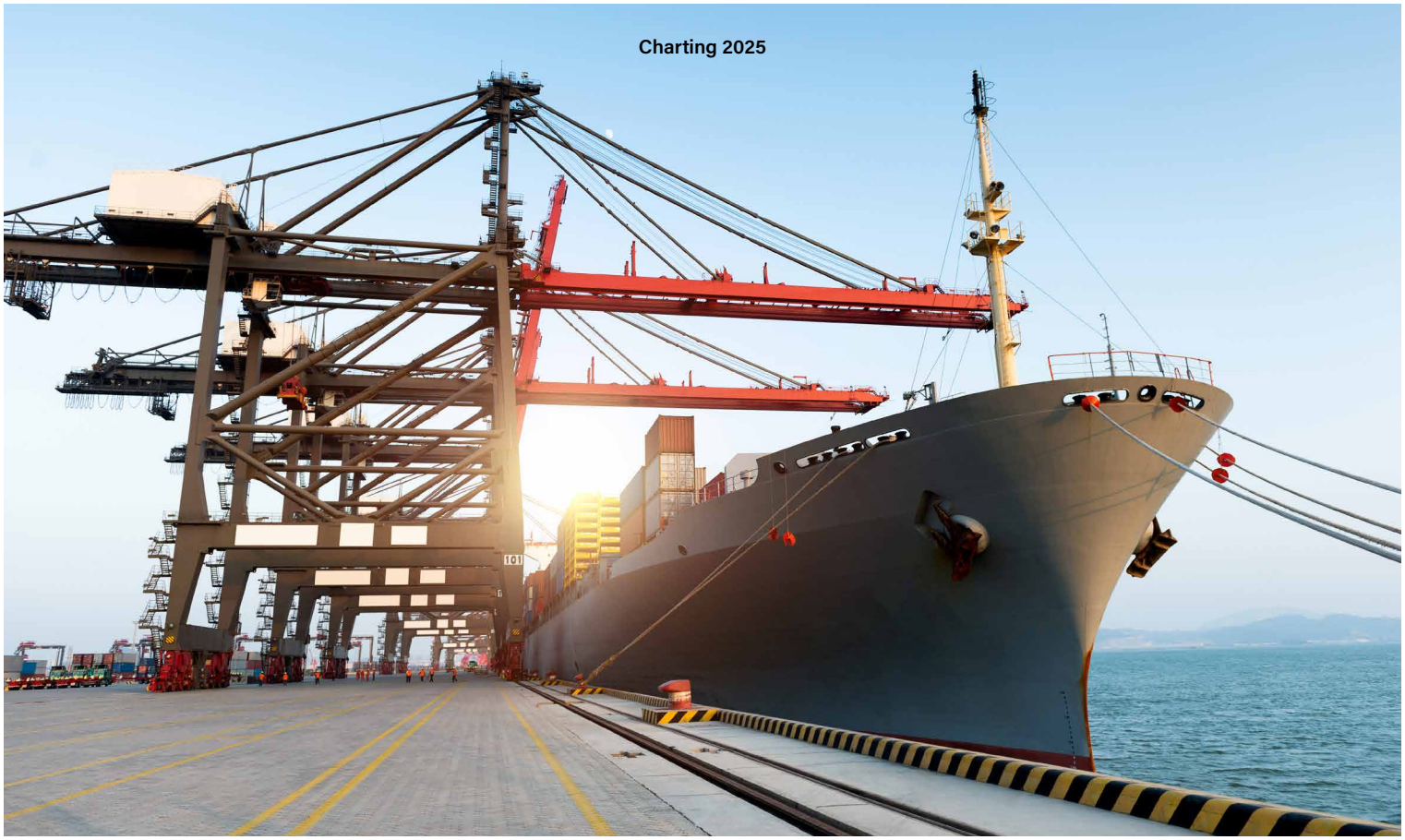
2024 has been a year of real progress, especially in decarbonisation efforts. With regulations tightening, we've seen a noticeable shift towards greener fuels like ammonia and methanol. Leading shipping lines have already launched pilot programmes; alongside this, frameworks like IMO 2024 continue to push the decarbonisation agenda, while the EU Emissions Trading System (ETS) has placed more pressure on shipowners to reduce carbon emissions.

Security has also been top of mind this year, particularly in the Red Sea. Piracy in the Bab el-Mandeb Strait has been a growing concern, causing many shipping companies to reconsider their routes. This, in turn, has disrupted trade flows and led to rising freight rates, as vessels seek safer routes or take additional security measures.

On the digital front, we've seen rapid progress in automation and data analytics. Shipping companies are investing more than ever in technology to boost efficiency. Ports are also catching up, implementing automated systems to streamline processes like container handling and cargo tracking. Artificial Intelligence (AI) is becoming more involved in route planning, predictive maintenance, and security, helping the maritime industry stay ahead of the curve.

For this edition, we've asked some of our contributors to share their most successful stories from 2024, but also to offer a sneak peek into what's coming in 2025. One thing that stands out is the role innovation has played this year, along with a growing sense of optimism for the future. But that optimism will only become reality if the industry comes together. The key takeaway from our contributors is the recognition that innovation alone isn't enough—it's the collaboration across the sector that will drive success and open up new opportunities.

As we wrap up 2024, we hope this issue offers you valuable insights. Let's keep the conversation going into 2025. See you in the new year!



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BREAKING THE TECHNOLOGY PARADOX: 2025 WILL BE THE YEAR OF INNOVATION WITH INTENT

Kevin Martin, CEO, One Digital Nation

Let me ask you a question. Do you remember when installing a 4G network was considered groundbreaking? Or when the launch of a shiny new app was enough for a company to claim its seat at the innovation table?

Those were the halcyon days of "tech for tech's sake". It was a time when simply adopting technology was seen as a win, regardless of whether the solution fitted the problem. Often, those were solutions in search of a problem, and the problems they were applied to could have been solved in better ways.

Those days make me wonder: when did innovation become the simple act of using new technology? What happened to the true spirit of innovation, to people in dark rooms hacking tools for purposes they had never been designed for?

Surprising as it may seem, those days were only a few years ago. Those two examples in the first paragraph are taken from presentations given at Smart Digital Ports of the Future in 2019.

Fast forward to today, and although much has changed, some things remain the same. Looking at this year's Smart Digital Ports of the Future conference, we've come a long way. Ports and terminals have become adept at acquiring advanced tools, from AI-powered energy optimisation platforms transforming yard efficiency to gaming engines rendering three-dimensional digital twins of ports, fed by real-time data from the Internet of Things.

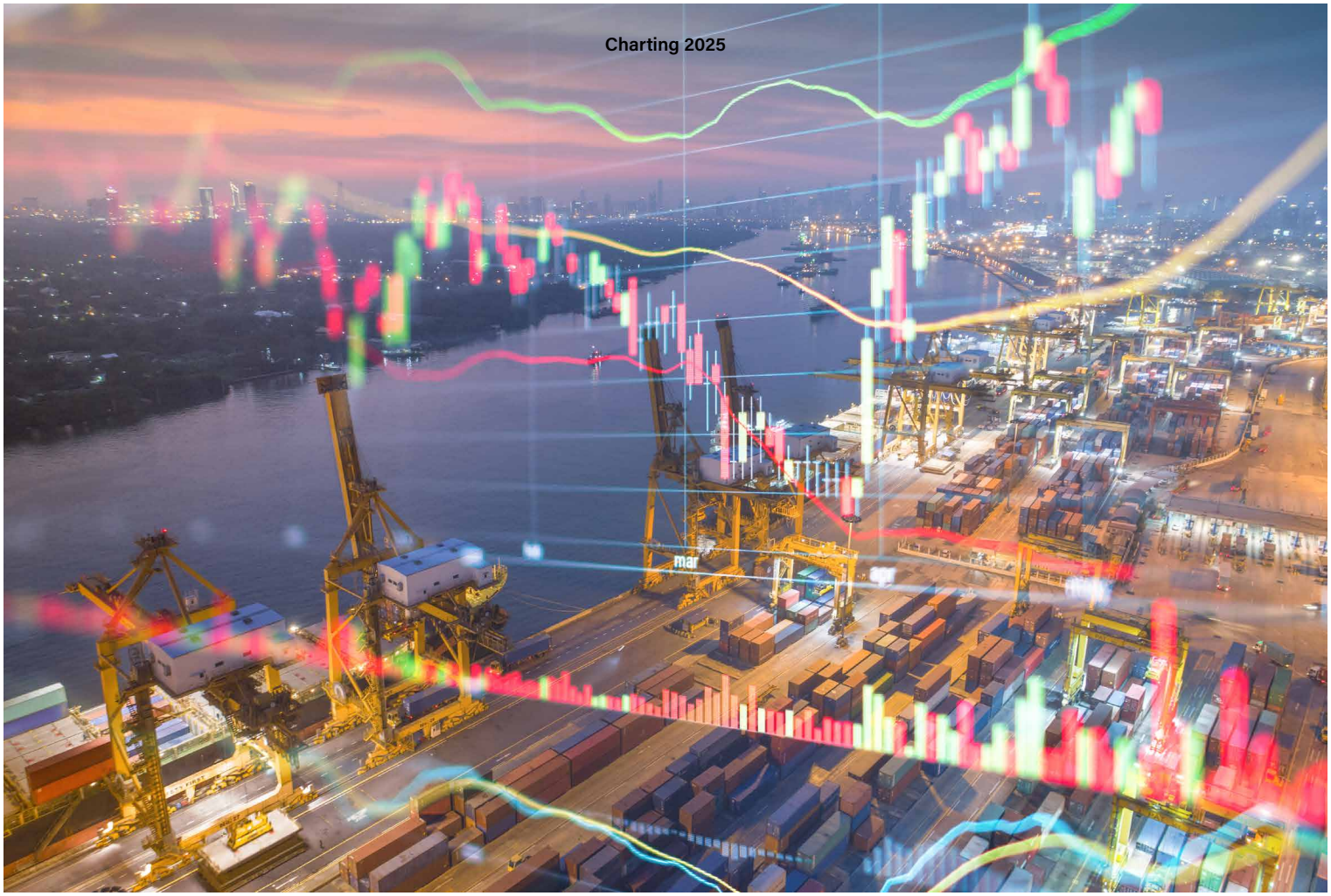
Despite all this capability, a curious paradox remains: why is the industry still seen as conservative, and why aren't we seeing transformative change that matches the promise of these technologies?

"IN 2025, THE BIGGEST INNOVATION WON'T BE THE TOOLS WE DEPLOY BUT THE MINDSET WE ADOPT TO ENSURE THEY DELIVER MEANINGFUL, SUSTAINABLE VALUE."

The answer isn't in the technology itself. It lies in how we use it—or, more accurately, how we think about using it. In 2025, the biggest innovation won't be the tools we deploy but the mindset we adopt to ensure they deliver meaningful, sustainable value.

Picture this: a department in a port authority rolls out a cutting-edge system. It's fast and efficient. The users love it. But six months later, they're still experiencing complaints from customers and colleagues in other departments, and overall, the business hasn't really seen the results that were promised. Why is that? The answer is simple. This impressive system was deployed in isolation.

Welcome to the technology paradox. While we may have mastered the "what"—the digital systems—we're still struggling with the "how." How does a business



"HOLISTIC SYSTEMS THINKING MUST BECOME THE NEW NORMAL, WHERE DIGITAL TOOLS ARE TREATED AS A NETWORK OF APPLICATIONS, RATHER THAN A COLLECTION OF ISOLATED SOLUTIONS."

capture the real value of digital tools? How does it align technology deployments with the broader goals of the organisation and the needs of its stakeholders?

The problem isn't technological; it's behavioural. Human beings are wired to seek quick wins and measurable results. That may have worked in the past when the innovation laid in the familiar world of heavy engineering—cranes, yard equipment, and storage solutions.

Digital technology's true potential doesn't lie in faster machines or smarter software—it's the psychological connections between them and the people who use them.

Imagine a port where every department proudly operates its own system. The Engineering team has a system for tracking equipment repairs. The Operations team uses a different tool to schedule cargo movements. And the Finance team? They're juggling spreadsheets. Each tool is great on its own, but together? It's chaos.

Silos persist because they are a comfort zone. In 2025, siloed thinking will become a danger zone. Holistic systems thinking must become the new normal, where digital tools are treated as a network of applications, rather than a collection of isolated solutions. The reason is simple. The value of any single tool is amplified when it's part of a broader, integrated ecosystem.

A holistic approach doesn't just improve operational efficiency. It switches the narrative completely. The inward focus on optimising solely for the port's benefit suddenly becomes an outward focus on transforming supply chains, improving customer experiences, and driving industry-wide progress. This is the kind of innovation that really matters—not just for the bottom line, but for the people and industries that the port or terminal serves.

If I asked you to measure the value of your latest technology

“AS WE LOOK TO 2025, LET’S REMEMBER THAT THE MOST IMPACTFUL INNOVATIONS ARE THOSE THAT ALIGN TECHNOLOGY WITH TRUST, COLLABORATION, AND SHARED GOALS.”

deployment, where would you start? Cost savings? Increased throughput? These traditional yardsticks are fine for traditional physical work. But, for knowledge-based work in 2025, we need different metrics.

Value can be more than numbers on a balance sheet. Value can also be found in community perception, employee experience, and customer trust. Rory Sutherland, an advertising executive and behavioural science expert, calls this “psychological value”—the intangible yet undeniable benefits that resonate with people—especially customers. It’s why a perfectly designed terminal doesn’t just function well; it feels efficient and welcoming to employees, customers and visitors alike.

Decarbonisation is a perfect example. Ports that invest in green technology aren’t just reducing emissions; they’re enhancing their reputations with customers, communities, and regulators. The return on investment isn’t just economic—it’s social, legal, political, ethical, environmental, and importantly from a human-centric perspective, emotional.

This is the new lens through which we must view technology. It’s not just about what it does but how it makes people feel about our organisations and the relationships it fosters. In 2025, leaders who understand this will redefine what it means to succeed.

2025 and beyond promises challenges, from decarbonisation deadlines to geopolitical uncertainties. But it also offers an unprecedented opportunity: the chance to think differently about technology.

What if we stopped asking, “What can this tool do?” and started asking, “What problem are we solving for people?”; what if success was measured not by efficiency alone but by the ripple effects of innovations on the communities that the port serves?

I’m not suggesting we abandon technology. I’m suggesting that we use it intentionally and with purpose. The tools of 2025 are ready. The question is, are we?

Looking back over those five years since I first visited a Port Technology event, it has undoubtedly been a period of education, experimentation and discovery. Ports and terminals around the globe have taken bold steps to implement Digital Twins, IoT devices for environmental management, and AI for predictive maintenance. But the most successful stories weren’t about the technology itself—they were about the human element behind it.

Technology succeeds when people believe in it. As we look to 2025, let’s remember that the most impactful innovations are those that align technology with trust, collaboration, and shared goals.

The port industry in 2025 won’t have the luxury of standing still. Decarbonisation targets loom. Geopolitical tensions disrupt global trade flows. Labour shortages reshape how businesses think about talent. These challenges are real, but they’re not insurmountable.

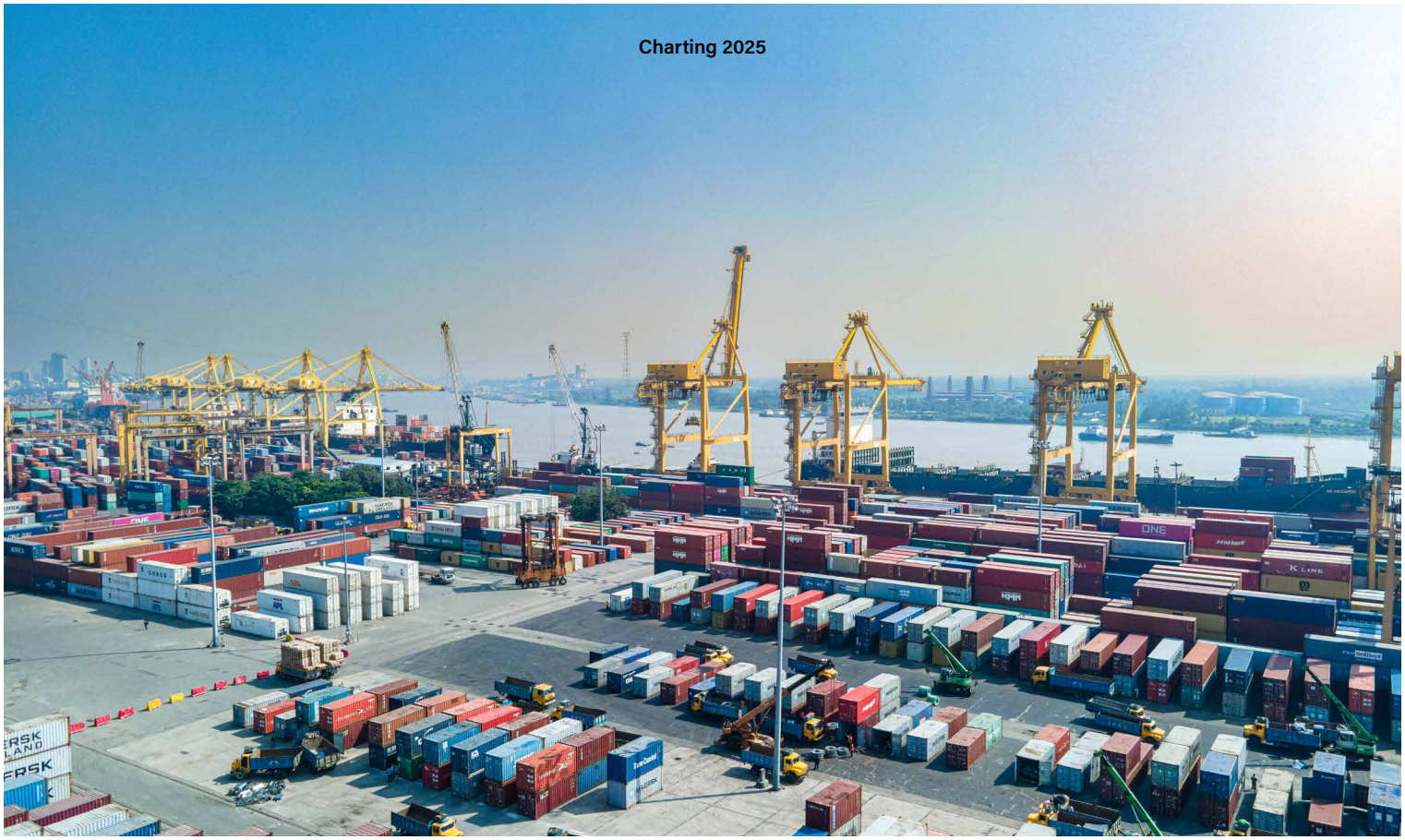
Many ports are investing in electrified equipment, renewable energy, and sustainable infrastructure to meet global targets. But the challenge isn’t just technological—it’s strategic. How do businesses that often operate on tight margins balance the need for immediate action with long-term planning? How do they ensure that investments deliver value not just environmentally but economically and socially?

Similarly, labour shortages can’t just be solved by hiring more people. The industry faces a double-edged challenge—an ageing workforce and a new generation reluctant to enter a legacy industry. We need to rethink how ports embrace change. Automation can fill some gaps, but we also need to invest in up-skilling, creating roles that blend human ingenuity with technological support. But here’s the kicker. Higher skills demand higher pay. Those solutions designed to reduce costs may in fact end up costing more.

These challenges require more than innovation. They demand uniquely human qualities. Resilience, adaptability, and most importantly, empathy. A focus on people. In 2025, the companies that thrive will be those that view obstacles not as barriers but as opportunities to lead.

I feel confident that 2025 will showcase more ambition in the industry. Technology will continue to generate headlines. But the real story won’t be the projects themselves. It will be the mindset behind them. Too often, we build for process, rather than people, resulting in resistance and inefficiency. A human-centric approach will design solutions to meet user and customer needs.

To illustrate my point, let’s think about Port Community Systems. For over 40 years, these platforms have been connecting every actor in the supply chain with a seamless flow of information. At the time of its inception, the technology was impressive, and it still is, but its



"INNOVATION IN 2025 WILL BE ABOUT BREAKING DOWN SILOS, REDEFINING VALUE, AND PUTTING PEOPLE AT THE CENTRE OF TECHNOLOGY STRATEGIES."

success relies on something much simpler: collaboration.

As the industry continues its exploration of new and emerging technologies, ask yourself—will we see stakeholders embracing the same shared vision, or will competing interests get in the way of progress?

The advent of AI-driven predictive analytics for equipment maintenance is another case in point. The technology itself can reduce downtime and save millions in lost productivity, but only if organisations prioritise simple yet foundational things—like data quality and involving frontline workers.

The lesson is clear: success doesn't rest solely on the technology but on the strategies, partnerships, and people that bring these projects to life.

As we prepare for 2025, with more tools than ever at our disposal, the question isn't whether the technology is ready. It is. The question is whether we are ready to use it differently.

Innovation in 2025 will be about breaking down silos, redefining value, and putting people at the centre of technology strategies. It will be about asking better questions and embracing oblique solutions. Above all, it will be about recognising that the greatest transformation won't happen in our hardware or software—it will happen in how we think.

Let's make 2025 the year we finally shift the narrative. Stop chasing the next shiny tool. Start building the systems, cultures, and mindsets that will truly transform the industry. In the end, there's nothing smart about bad use of technology. The biggest innovation of all isn't in the tools we deploy—it's in the way we choose to use them.

In 2025, the smartest ports won't just use technology. They'll use it wisely.

ABOUT THE AUTHOR

Kevin Martin is a visionary leader with extensive technology leadership experience in ports and supply chains. Kevin has diversified from pure-play consultancy, forming One Digital Nation to pioneer innovative solutions that empower organisations to harness the power of current and emerging digital technologies for strategic growth and operational excellence.

ABOUT THE COMPANY

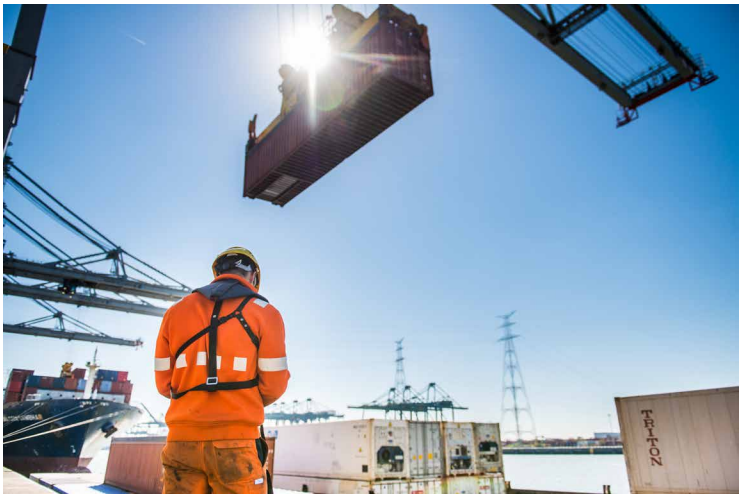
One Digital Nation is a technology-driven company specialising in digitalisation and business transformation consulting for organisations in ports, logistics and supply chains. The company pioneers an innovative six-step approach to transformation and empowers businesses with industry-leading practical digital tools and solutions that deliver real competitive advantage.

SAILING INTO THE DIGITAL FUTURE: HOW TECHNOLOGY WILL REVOLUTIONISE MARITIME LOGISTICS

Que Tran, Vice President - Technology - P&T and Transformation, Europe

Shipping plays a critical role in our lives, delivering 90 per cent of goods to eight billion people around the world—and the industry is forecast to grow by 20 per cent by 2030. To ensure this vital industry remains at peak competitiveness going forward, we must continue to use innovative digital technologies to create a more collaborative, transparent, and streamlined sector.

Networks and technologies like the Internet of Things (IoT), Artificial Intelligence (AI), and the cloud are already empowering the maritime industry in a myriad of ways—from optimising vessel speeds to reducing fuel consumption and improving connectivity between land and sea. However, greater integration holds the potential to not only render our global supply chains more efficient but also significantly reduce emissions in line with the International Maritime Organization's goal of moving the industry to net zero emissions by 2050. To reap these benefits, however, businesses must seize the opportunities offered by digital tools and work with trusted partners in 2025 and beyond to transition to a digital future.

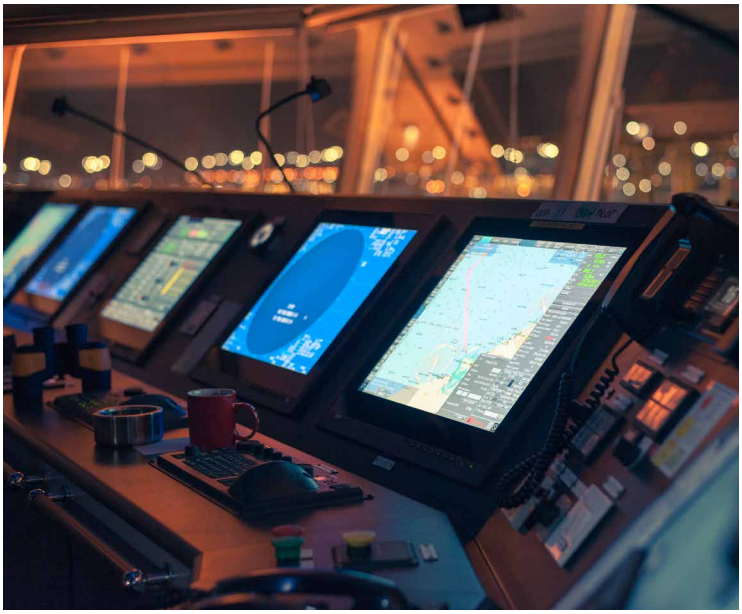


FIXING MARITIME'S DIGITAL DISCONNECT

Despite technological advances being made across the maritime industry, various challenges are holding back the sector in fully embracing more digital ways of working. Firstly, the industry is still highly fragmented and siloed, with a lack of interoperability across systems and data platforms, which restricts end-to-end cargo connections and sustainability objectives. The latter needs to be addressed as soon as possible as companies, and countries that are unable to use standardised systems to monitor, analyse, and ultimately reduce their emission levels will be fighting a losing battle against climate change. For instance, a cargo vessel may use one system to track its carbon output, while the port it arrives at uses a completely different platform, making it nearly impossible to align data. This lack of interoperability reduces accurate emissions monitoring

"THE INDUSTRY IS STILL HIGHLY FRAGMENTED AND SILOED, WITH A LACK OF INTEROPERABILITY ACROSS SYSTEMS AND DATA PLATFORMS, WHICH RESTRICTS END-TO-END CARGO CONNECTIONS AND SUSTAINABILITY OBJECTIVES."

“AT DP WORLD, WE BALANCE OUR SYSTEMS AND CAPABILITIES WITH THE ADOPTION OF INDUSTRY-WIDE STANDARDS AND BEST PRACTICES TO PROMOTE INFORMATION SHARING AND HELP IMPROVE INTEROPERABILITY AND EFFICIENCY ACROSS THE SECTOR.”



and coordinated reduction efforts, leaving both parties struggling to meet their climate goals effectively.

Operational resilience also remains a challenge in a sector highly exposed to unforeseen global disruptions. This was highlighted in the 2021 Suez Canal blockage, in which Digital Twin technology could have been a game-changer. A Digital Twin—a virtual replica of the canal, surrounding infrastructure, and traffic—could have provided real-time data and predictive insights to model alternative scenarios. By simulating traffic rerouting, vessel prioritisation, and logistics adjustments, a Digital Twin would have enabled quicker decision-making and minimised the supply chain disruptions caused by the blockage.

UNITING THE SUPPLY CHAIN: DIGITAL SOLUTIONS TO ENHANCE CONNECTIVITY

I believe that the siloed systems of data and operational resilience can be addressed through the adoption of modern standards and digital interoperability. Moving towards open standards and away from legacy systems like Electronic Data Interchange (EDI) can streamline data sharing and improve system integration across global platforms. At DP World, we balance our systems and capabilities with the adoption of industry-wide standards and best practices to promote information sharing and help improve interoperability and efficiency across the sector.

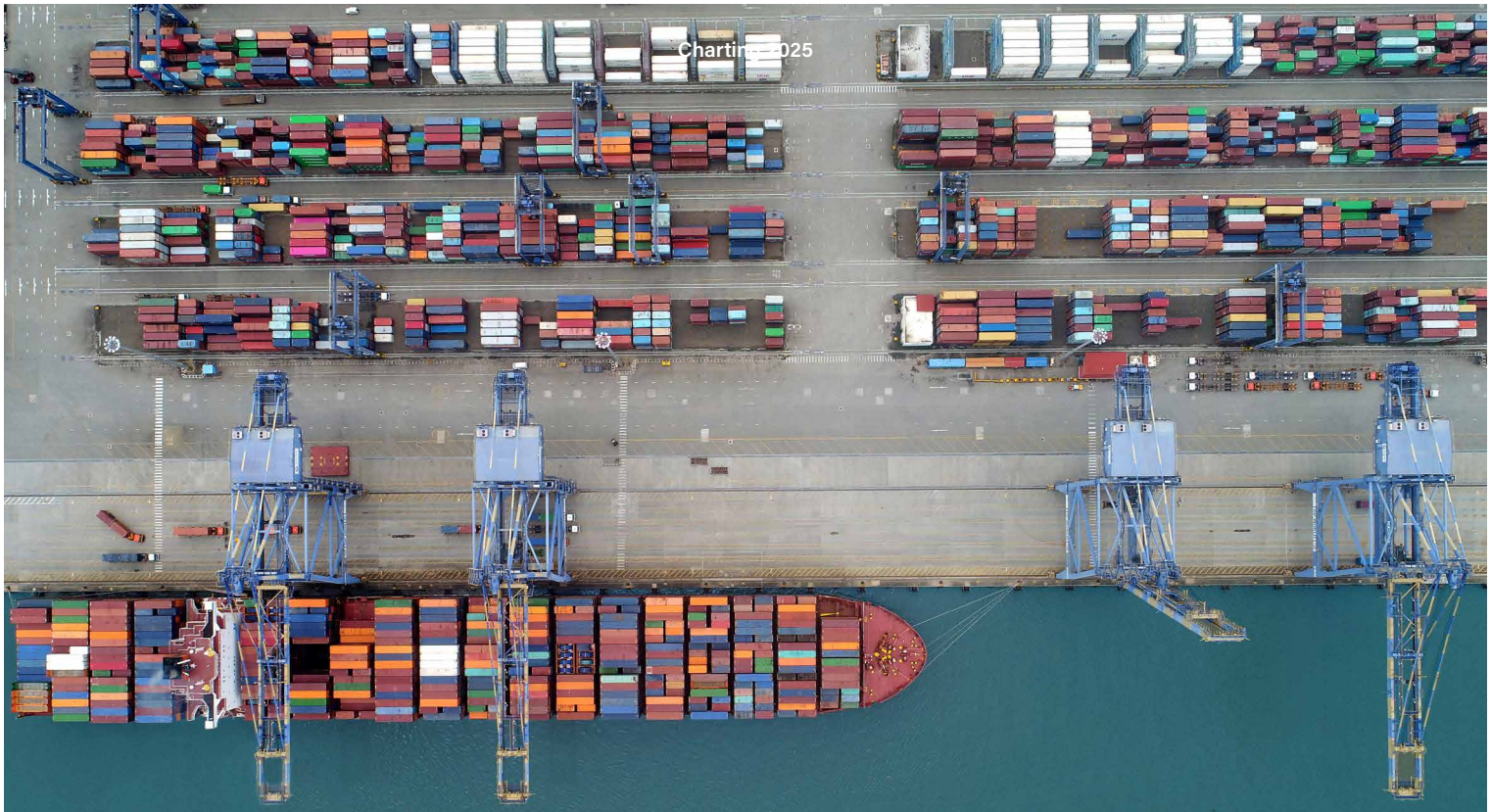
Leadership in industry standards is crucial for driving innovation across the maritime sector. As a member of the Executive Council and Operations Council for Terminal Industry Committee (TIC4.0), we are helping to lead the standardisation of data formats and streamline information sharing, helping to modernise global supply chains. As the industry moves toward advancements such as autonomous vessels, the need for these standardised communication protocols, including machine-to-machine interfaces, becomes even more pressing. These efforts are critical to ensuring efficiency, transparency, and sustainability across the entire logistics ecosystem.

Greater collaboration across the maritime sector can be facilitated through digital tools that help connect stakeholders, improve transparency, and streamline operations. For instance, platforms such as Cargoes Community are designed to link various participants in the supply chain, from port operators to shipping companies and customs authorities. This enhances communication and coordination. Additionally, dashboards like Cargoes Flow provide real-time visibility of goods in transit, allowing stakeholders to track shipments and manage bottlenecks more effectively.

These tools optimise the supply chain by ensuring that all parties access the same information, promoting more efficient and responsive logistics operations.

FROM THE CLOUD TO THE CRANES

Although the maritime industry still has a long way to go in its



“WE WILL SEE GREATER ADOPTION OF AI-BASED APPLICATIONS ACROSS THE INDUSTRY OVER THE COURSE OF 2025, WITH PREDICTIVE ANALYTICS, PREVENTIVE MAINTENANCE, AND ROUTE OPTIMISATION ALL BECOMING MORE WIDESPREAD.”

digital transformation, several key technologies are gaining traction. Cloud computing is one such example that enables global connectivity and seamless data sharing, helping the industry move away from siloed systems that are limited to specific locations, terminals or vessels. This shift is crucial for streamlining operations and improving efficiency.

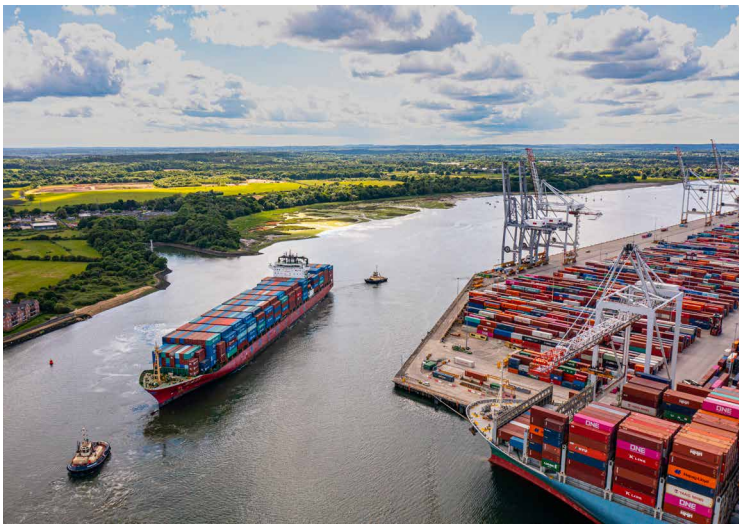
DP World is advancing this transition through our Cargoes Terminal Operating System (CARGOES TOS+), which operates from the cloud at many facilities worldwide including Cyprus and Thailand. This cloud-based solution allows us to enhance operational flexibility and allow for real-time data access and more agile management of port and terminal activities.

IoT and Smart Connected Solutions (SCS) are also enhancing logistics by enabling cranes and containers to share real-time data. For example, we now work with cranes with over 18 tracking embedded sensors that can track movements and optimise performance. This data allows for predictive maintenance, minimises downtime, and improves efficiency by adjusting crane operations dynamically. By improving data sharing and coordination, these smart technologies drive better decision-making, reduce costs, and enhance supply chain performance.

The rise of AI has been swift across many industries and, in our sector, it is now deployed for data-driven optimisation, including predictive maintenance and operational efficiency in terminal and shipping activities. We are also using it to help minimise (operational) waste, which ultimately supports our sustainability goals. However impressive this progress is already, we believe that the sector is still in the early stages when it comes to making the most of AI’s full potential.

At DP World, we continue to integrate all these transformative digital technology products and services into how we build end-to-end supply chains to enhance transparency, efficiency, and sustainability. The cloud has already enabled us to design scalable systems for 114,000+ employees across multiple countries, eliminating the need to develop location-specific systems.

In addition to IoT and automation, is the transformation of Optical



"MARITIME LOGISTICS IS AN ANCIENT AND OFTEN TRADITIONAL INDUSTRY, BUT IT IS BECOMING MORE OPEN TO CHANGE, AND WE MUST SEIZE THE OPPORTUNITY."

Character Recognition (OCR)—a technology that scans and interprets text from physical documents or images, allowing the system to automatically read and process container numbers, license plates, and other critical information—is being used to streamline entry and exit processes at terminals through automated gate systems. We term this AVA+ (Advanced Video Analytics Plus), which utilises AI deep learning-based intelligence on images and video.

The use of this technology by DP World will be seen in our deployment of Cargoes AVA+ AGS, an automated gate system at Southampton—set to launch imminently—which will use OCR and deep learning AI to facilitate faster and more accurate cargo processing at the terminal.

WHAT'S NEXT FOR MARITIME TECH? PREDICTIONS FOR 2025 AND BEYOND

I predict that we will see greater adoption of AI-based applications across the industry over the course of 2025, with predictive analytics, preventive maintenance, and route optimisation all becoming more widespread. We will also see systems that are currently being trialled, moving to more meaningful, real-world implementations.

Cloud and IoT are also expected to mature, with more organisations using these technologies for seamless, integrated, efficient operations across maritime logistics. As our reliance on these technologies increases, the need for cybersecurity will also likely grow, with higher investments to mitigate risks tied to digital infrastructure. Thus, the digital technologies we introduce should be Smart, Sustainable and Secure (abbreviated as S3).

THE CASE FOR CHANGE IN A 'TRADITIONAL' INDUSTRY

There is a growing, industry-wide recognition of the importance of employing digital technology in maritime operations. However, while the adoption of new technologies has undoubtedly accelerated across the industry, we need to go further and faster to meet the challenges we face.

Maritime logistics is an ancient and often traditional industry, but it is becoming more open to change, and we must seize the opportunity. Technology is now essential to the sector and has gained widespread recognition as a driver for sustainable and efficient operations.

As we move into 2025, digital tools will continue to have a transformational impact on logistics, from reducing delivery times to better management of resources, and speed through ports. I anticipate exponential growth in technologies such as AI, IoT (Smart Connected Devices), and cloud computing, reflecting the industry's ongoing digital evolution. After all, a strong focus on the increased transparency, operational efficiency, and performance they bring is what will be required to not only survive but thrive in the years ahead.

ABOUT THE AUTHOR:
Que has extensive senior technology and transformation leadership experience, with a focus on cyber, digitalisation and sustainability initiatives to help protect, optimise and transform organisations and the industry.

Que is currently leading the Ports & Terminals and Transformation Technology function across Europe at DP World and has been named among the top 30 leading business and technology executives in the CIO 100 by CIO UK for three consecutive years.

ABOUT THE COMPANY:
Trade is the lifeblood of the global economy, creating opportunities and improving the quality of life for people around the world. DP World exists to make the world's trade flow better, changing what's possible for the customers and communities they serve globally.

With a dedicated, diverse, and professional team of more than 113,000 employees spanning 78 countries on six continents, DP World is pushing trade further and faster towards a seamless supply chain that's fit for the future.