

OPPORTUNITY. 機匯

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WILL THE AGE OF AI DAWN FOR SUPPLY CHAINS?



ARTIFICIAL INTELLIGENCE - A NEW REALITY FOR SHIPPING? | BEYOND SMART SHIPS - THE SOCIETAL DESIRABILITY OF AUTONOMOUS VESSELS | DRONES, VANS AND TRUCKS OF THE FUTURE - THE FUTURE OF DISTRIBUTION | OIL PRICES RISE THREATENS BOTTOM LINE | BLOCKCHAIN - THE NEXT GAME CHANGER? | NEW HORIZONS FOR HUTCHISON PORTS THROUGH JOINT VENTURE WITH TMA LOGISTICS | REMOTE-CONTROL YARD CRANES RECONFIGURED RTGCS TO BOOST CT9 PRODUCTIVITY | GREEN PORT ROTTERDAM

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WORLD CUP YEAR PROVIDES INSPIRATION FOR OUR TEAM

This year marks the 21st FIFA World Cup, an international football tournament held every four years and there are many similarities between our business and the 'beautiful game'.

We are now approaching the half way point in our current season and I am generally positive in terms of our performance 'on the pitch' and how trade activities are moving for Hutchison Ports. I am being asked by customers and stakeholders how I view the trade dispute currently bubbling under between China and the US and how it could potentially impact container shipping.

I am optimistic that many consumer goods being shipped will remain unaffected by the tariffs imposed, and that mainly commodities and high-end electronics will be affected, the latter of which is carried as airfreight.

The main issues are a result of geopolitics in different regions of the world which are causing uncertainty for businesses and dampening the appetite of investors.

We recently had a team meeting where we formulated a plan for the rest of the season, we decided that we were going to focus on not conceding too many own goals and to have a strong defence and be ready to launch counter attacks at the right time during the game.

As manager of the team I am keen that we are able to protect our lead over our competitors and we can do that by taking a fresh look at costs throughout our global network of ports during every game. Of course, we are eager to score goals by bringing in new business and if we can do this as well as keeping things tight at the back, we will have a better chance of winning more games. We have made steady progress as a team but there is always room for improvement, so we can move up the league table.



ERIC IP
Group Managing Director
Hutchison Ports

Last but not least, I have also been asked about Mr. Li Ka-shing, Chairman of our parent company CK Hutchison Holdings who announced his official retirement in May and whether there will be changes in our business direction. We would all like to thank Mr. Li for his leadership and guidance during his tenure. Mr. Victor Li, currently Group Co-Managing Director and Deputy Chairman, will become Chairman and has worked closely with us for many years and knows the business very well.

As with many football clubs, senior management changes do happen and we are fortunate to have stability and continuity during this transition, which provides us with a strong foundation for the future. A successful team is built when management, players, staff and supporters are working as one and have shared 'goals', this is the formula that will drive our club on to success.

ARTIFICIAL INTELLIGENCE

A NEW REALITY FOR SHIPPING?



Companies that fail to take advantage of the benefits of Artificial Intelligence (AI) will be at a commercial disadvantage. That's the message ringing loud and clear from academics and industry professionals alike. Put simply, AI technology is a game changer – in our business and personal lives.

Take a recent high-level research report by MITSloan, in collaboration with The Boston Consulting Group (BCG), entitled 'Reshaping Business with Artificial Intelligence'. It surveyed 3,000 managers, executives and analysts in many industries across the globe. Research indicates that around 85 percent of respondents believe AI could have dramatic commercial benefits.

However, only about one-fifth of companies had incorporated AI in any form into their processes or service offerings. A key conclusion of the report is that companies must act now to plan for AI, and those that fail to do so will have the "playing field tilted evermore steeply against them".

From the outset it is worth reminding ourselves of a definition of AI from the Oxford Dictionary, "AI is the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages."

According to Professor Yi Yang, Assistant Professor, Information Systems, Business Statistics and Operations Management, Hong Kong University of Science and Technology, there are four main aspects to the successful development of AI.

He stressed, "Massive amount of valuable data, fast computing power, efficient and effective algorithms and vast financial support from private and public sectors are responsible for the fast development of deep learning as well as AI."

AI AT A HIGH POINT

By 2020, the global demand for AI-related products is expected to reach US\$47 billion, with healthcare and financial services industry sectors continuing to drive its uptake and evolution, as reported by *Mondaq*.

Indeed, AI stands at a high point in its evolution, according to Dr Yvo Saanen, Commercial Director and founder of TBA Group. He believes the combination of factors cited above makes the power of learning behaviour and pattern recognition software much greater. This has implications for industries that want to harness this technology.

He stressed, "The container industry is very repetitive. Hence, learning from the past helps improve decision-making in the future. So, within the terminal operating systems, or within surrounding intelligence modules, there's great potential to use AI technology to address these issues. One hurdle to overcome is quality of data; today the quality is still quite poor," said Saanen.

"So, until we get solid information throughout the supply chain, shared and put into algorithms, it will be very difficult to make good high-quality decisions," he added.

In the longer term, Saanen expects to see AI incorporated inside automated equipment and vehicles, to make them more autonomous. He also foresees opportunities for automatically generated stacking systems to operate cranes and move containers, and the co-existence of partial autonomy and central optimisation.





The Port of Rotterdam is teaming up with IBM to work on applications of the Internet of Things (IoT) and AI. A recent initiative is to use sensors to gather multiple datastreams to enable port authorities to predict the best time (based on water level) to have ships arrive and depart Rotterdam.

Another innovation incorporating AI is DHL's Global Trade Barometer, launched earlier this year, which derives predictions for global trade by evaluating large amounts of logistics data with the help of AI.

Tim Scharwath, CEO of DHL Global Forwarding & Freight, said, "The DHL Global Trade Barometer shows impressively how digitalisation – with the use of Big Data and Predictive Analytics – opens up entirely new opportunities that we can use for the benefit of our customers."

IMPORTANCE OF DATA

At a recent seminar held at Hong Kong Science Park, with the theme 'AI Platform for Smart Applications', one of the key considerations from a variety of high-level speakers was the essential requirement of data for effective AI – as the saying goes 'garbage in, garbage out'. Thus, companies need to have built robust information infrastructure, so algorithms can learn effectively by monitoring the data, said Yang.

Professor Yi Yang concurs that AI is only as good as the data provided. Yang stressed that companies need to focus on getting valuable data. It is a question of quality over quantity.

Yang added, "Before blindly collecting data, a company needs to decide what its goal is. Reduce shipping cost? Optimise transit routes? Once the goal is set up, then the company needs to figure out what types of data to collect, from traditional structured accounting data to non-traditional unstructured data generated from sensors, GPS devices, and so on."

However recent developments in transfer learning, a machine-learning technique that focuses on storing knowledge gained while solving one problem and applying it to a different (but related) problem, has started to draw attention from both academics and industry thinkers.

Yang explained, "For example, an AI model trained to recognise cars could be reused to recognise trucks. Transfer learning can significantly reduce the effort of obtaining data and training an algorithm model. Therefore, we expect to see successful AI applications where data is limited or even not provided."

Yang supports recent analysis by a wide variety of commentators that AI can positively impact every aspect of supply chain management.

He said, "The self-driving fleets can reduce, estimated to be around 80 percent, shipping cost, which benefits companies in a variety of sectors that rely on the vehicles for shipping."

WAREHOUSE MANAGEMENT

Another area will be warehouse management, according to Yang. The core of successful supply chain management is efficient warehouse and inventory management. By providing accurate demand forecasting, he added, AI technology will reshape warehouse and inventory management process.

A *Financial Times* report recently investigated the development of robots in ecommerce warehouses. The reporter visited Ocado's warehouse facility near Andover, in the south of England. A centralised computer system using a planning algorithm communicates with robots deployed within the vast warehouse. These robots can collaborate in a swarm and, remarkably, can complete a 50-item customer order within minutes.

At a separate DHL facility, some collaborative robots (aka cobots) are being installed to work alongside humans, and these cobots can be shown tasks and respond to touch without the need for preinstalled programming, supporting repetitive and physically demanding tasks in logistics operations.

Some well-informed commentators have speculated that the implications of biometric facial recognition technology could eliminate the need for scanners, it could guide vehicles within and away from the warehouse. It could also improve safety standards and productivity levels as scanners would be surplus

to requirements: someone would just need to glance at the products. According to DHL trials of so-called 'smart glasses' during order picking in logistics, which enable intelligent hands-free operations and harness Augmented Reality (AR), a 25 percent upturn in efficiency was observed.

Industry sources suggest characteristics of AI technology are now being used on mobile apps, where users can photograph a desired item and visual recognition technology can search for a matching item.

CHATBOT

According to Yang, it is Deep Reinforcement Learning, an emerging AI technique, that will significantly enhance operations. Some commentators compare Deep Learning to the workings of the human brain that can sift through data more effectively and speeds up the analytical process. This technology is being incorporated in manufacturing operations in a joint venture including, Hitachi, Fanuc, and an AI start-up called Preferred Networks Inc., as reported by *Nikkei Asian Review*. This should dramatically improve productivity.

Yang explained, "Unlike traditional supervised machine learning where domain knowledge has to be provided, Deep Reinforcement Learning can figure out how to do things that no expert need to or could teach them."

"Take Chatbot for example, the Deep Reinforcement Learning powered Chatbot can observe from the conversations between human agents and customers, simulate the conversations with itself, understand what contributes to the success of a dialogue and eventually generate meaningful and accurate conversations with customers, which reduces operational costs," he stressed.

Peter Spellman, Chief Technology Officer at INTTRA, a global technology platform enterprise, is confident Chatbots will become more ubiquitous in the coming years and offers great benefits to customers.

"Chatbot-AI application would recognise that a specific customer regularly books certain routes, learning from the customer's past bookings and behaviours. The Chatbot might complete the booking, or it will know to escalate and engage customer support when exceptions are required," said Spellman.

This will allow organisations to improve the booking process and free up staff to focus on more rewarding tasks. AI will help remove inefficiencies in the system by directing technology at areas that can be easily standardised, and which can benefit from processing power over a wide data set. This includes everything from prefilling of various forms, or aspects of customer service that will help customers find information and sources before they speak with a client.



WORK PATTERNS

For Spellman, this aspect to AI, the altering of working patterns is one of its key positives.

He explained, "AI is one of many in a series of disruptions over time, all of which change the shape of the workforce. AI programmes will continue to advance, but their shortcomings are why humans will remain key to AI implementation. Humans will handle exceptions and higher-end tasks, ones that require creative and original thinking, as well as leadership roles and other tasks."

Spellman concedes AI will cause disruption in the process, as is the case for practically all new technologies. He cited a report by Gartner which suggests AI will create 2.3 million new jobs and "has the potential to enrich careers, reimagine old tasks and create new industries."

Despite AI's potential, many logistics companies remain reticent to take up this technology despite the undoubted long-term benefits. Spellman cites various factors:



The logistics industry operates on tight margins so large IT projects that can take years to show positive Return on Investment (ROI) are generally slowly embraced.



Not all companies have in-house IT skills to implement AI.



Companies may be reticent assessing the fear vs hype equation. Many technologies offer great promise, but sometimes this can be overblown.

Spellman foresees information technology and AI as differentiators, and urges companies not to be on the wrong side of the digital divide. INTTRA's 2032 White Paper outlines where the logistics sector may be heading.

He echoes the sentiments of academics and other industry thinkers about the ability to store unlimited data in a cloud environment can begin the process of reasoning with it to create AI applications. This should enable the development of more meaningful AI applications.

In the future, AI should increasingly help with other critical tasks while working in conjunction with humans. For example, an error in Harmonised System (HS) codes, which is not uncommon, but necessary for shipments, can cause significant delays and increase costs. AI coupled with Machine Learning could correct such errors without humans, unless it's unable to correct the issue on its own, according to Spellman.

Companies are looking at digitalisation, AI and all forms of technology to reduce costs through innovation, improve efficiencies and to generate higher revenues. Around 800,000 container orders are processed over INTTRA's platform weekly through more than 60 carriers. The intersection of AI with blockchain, quantum computing and the IoT and other transformative technologies is a key future trend.

Spellman said, "AI promises to further expand on the advantages of digitalisation, which is why companies are increasingly looking at what it can provide."

CHALLENGES

According to Professor Yang, adopting AI technology requires a holistic solution from data to IT infrastructure to manpower to organisational structure. By automating processes and making better decisions, early adopters of AI will enhance productivity and gain obvious competitive advantage, he claims.

"The AI system will also generate valuable feedback and new operational data which can further tune up the system setting. All those advantages will become barriers for competitors," said Yang.

In a recent commentary within the Council of Supply Chain Management Professionals (CSCMP) Supply Chain Quarterly, the author warned supply chain companies that they need to fully understand the impacts of a solution before adopting new technology, such as AI. For instance, operational costs may be reduced. But does this come at the expense of customer service quality and will this compromise customer loyalty?

For Professor Yang there are two main challenges for the development of AI. The first is a lack of 'multitask AI' or 'generalised AI'. Yang said almost all AI technologies are highly specialised with no AI system that can be trained to drive a car, play golf and translate languages.

"The second challenge is the lack of AI manpower. More universities are providing courses focusing on the skills needed for AI development – computer science, statistics, etc.. But there are still not enough people to enable every business and organisation to take up AI technology," said Professor Yang.

He also warned that AI is still decades away from true human-level intelligence and therefore AI practitioners from industry and academia should not overhype what AI can do.

He concluded, "Overpromising would result in investment loss as well as disappointment and distrust in AI capabilities."

Ultimately, as AI becomes more entrenched in our society, its implementation will raise many ethical and commercial challenges, but there can be little doubt the AI revolution bandwagon is set to roll on and on.

GLOSSARY



ARTIFICIAL INTELLIGENCE

Applying computers to tasks that normally require human-level intelligence, like reasoning, decision-making, problem-solving and learning.



BIG DATA

The huge data sets that can be analysed by computers and algorithms to reveal patterns, trends and associations.



MACHINE LEARNING

The capacity of an algorithm to learn from new information and modify its processing as a result, without being explicitly programmed to do so.



NEURAL NETWORK

An algorithm used in deep learning that imitates the activity of layers of neurons in the brain, filtering data through tiers of virtual brain cells.



DEEP LEARNING

The 'black box' of AI. Unsupervised neural networks that create their own processing constraints as they learn from vast troves of training data.

Source: New Scientist

BEYOND SMART SHIPS



With the recent announcement of Japan's intention to commercialise unmanned vessels by 2025, it appears that the technological development of ships is gathering pace. But questions are being raised by leading thinkers in the maritime sector about the direction the maritime sector is headed.

Japan's stated aim of being a leader in this field is driven by a variety of factors, according to sources quoted in *Lloyds List*. Investment in this technology is partly stimulated by concern of a future shortage of seafarers and increased competitive pressures from South Korea and across the globe. The Japanese government is positively backing applications for technology research by offering subsidies.

Indeed, the Internet of Things (IoT), virtual forwarders and e-navigation are just some of the developments that are changing the face of the maritime industry. In an industry often characterised by old-fashioned practices, yet increasingly complex and under constant pressure to maintain efficiency, technology can appear to be a 'silver bullet'.

Michele Acciario, Associate Professor of Maritime Logistics at Kühne Logistics University, has reservations about the way developments could progress.

"After almost a decade of record low freight rates, ship owners and operators are in dire need to find innovative ways to improve efficiency and service. But are autonomous ships really the way to reap the benefits of digitalisation?", he asked.

Acciario points out that while technological advancement in shipping is likely to be a positive development, the sector needs to consider how far technologies should go and what issues should be prioritised.

He added, "Only a vision aimed at making digitalisation subservient to quality shipping can turn smart ships into the real disruptor towards a sustainable future maritime transport sector."

Digitalisation is changing the shipping sector and some commentators suggest its impact could be greater than the introduction of the maritime container, more than 50 years ago. Improving communication and data exchange have been a long-standing priority for the industry. Examples of this include initiatives like the EU funded seventh framework project eMar and the IMO-led e-navigation strategy.

The simplification of the exchange of (electronic) documents, as well as data as part of the increasingly complex safety and security requirements imposed on shipping, is long overdue, Acciario claimed.

"The progressive reduction of the number of crew on board ships calls certainly for increasingly automated and simplified processes. And the ability of ships to exchange operational data in real-time could also improve ship management," said Acciario.

REMOTE MONITORING

Major recent developments are also related to (remote) condition monitoring, said Acciario.

"The opportunities offered by direct real-time remote access to ship technical data has opened the door to providing direct assistance to the crew, allowing them to take full advantage of instantaneous optimisation of ship operations in the future," he said.

Acciario also explained the increasing importance of sensors, "Virtually all aspects of navigation, from cargo loading and unloading, as well as engine performance, equipment and hull integrity, can today increasingly be observed remotely through sensors."

Advanced, more accurate and reliable sensors offer valuable information to prevent accidents, reduce maintenance costs, increase navigation safety and assure a more reliable and efficient maritime transport, he added.

Acciario pointed out a critical feature of remote monitoring. "This feature holds the possibility of assisting the marine master (aka the Captain) in making critical decisions on the vessel and can provide valuable information to shipowners and onshore managers for better planning of maintenance."

Weather routing - the ability to steer the course of navigation in real-time away from unfavourable weather conditions - is also an area where substantial advances have been made. Commercial software is already available, and substantial improvements are now possible for safety and cost reduction. Acceptance on deck, however, remains a challenge. This is because often the marine master or crew are sceptical about the accuracy of the systems and their reliability in real-life situations can be difficult to assess, Acciario warned.

“While remotely-controlled ships, that are piloted by people onshore, will not be a reality for a while, there will certainly be an increase in the role of people onshore in vessel operations.”

Martin Rowe, Managing Director of Clarksons Platou Asia Hong Kong, concurs with many of these misgivings.

He explained, “Whether self-controlled/autonomous deep-sea cargo vessels are even possible yet is unknown. Whether they are desirable is another matter.”

Rowe believes there are solid safety reasons why full blown autonomous ships may never happen.

“For ships the adage that ‘worse things happen at sea’ means that emergency scenarios will arise from time to time that have never been encountered previously. And these are probably better handled by sentient beings on board than trusted to solid-state electronics to solve, even if assisted by people in a control room somewhere on the other side of the world,” said Rowe.

He drew comparisons with passenger aircraft, claiming that there is very little public appetite to be a passenger aboard a self-piloted aircraft.

The maritime environment is a harsh and unforgiving one, explained Rowe. When cables and stays on deck snap or come loose on a 20,000 TEU container in a force 12 storm in the middle of the Atlantic, or something catches fire, having someone around to sort things out before the situation becomes critical is a good idea, he added.

However, when referring to ‘smart shipping’, Rowe considers there are many potential advantages and deliverables that may provide significant cost savings to the owner or operator. These bring significant commercial advantages.

Rowe said, “As my colleague, Professor Martin Stopford recently pointed out at an industry conference, with smart shipping (onboard sensors and satellites) the vessel goes from being a separate ‘profit chimney’ to an integrated part of a larger profit team tied into the whole fleet, constantly adjusting to gain maximum efficiency aided by teams of experts onshore and onboard vessel crews with 24-hour communications.”

BUT DO FULLY AUTONOMOUS SHIPS LOOM CLOSER?

According to Acciaro, one of the most promising technological developments associated with condition monitoring is the possibility of interconnecting operating systems directly without the intervention of humans.

The onset of technological progress (e.g. electronic sensors) coupled with growing data exchange capabilities through satellite and computing power have profound implications. For instance, the result has been the development of a wide range of autonomous vehicles, such as cars and planes. So - asks Acciaro - why not fully autonomous ships, able to navigate themselves across the oceans?

“While it is likely that in the beginning these autonomous systems will be used to assist the marine master and crew, we can imagine that operations on board will be increasingly automated in the future.”

“Full automation is likely to take a while, despite the recent optimism and publicity that has followed the planned launch of some pilot projects such as the *Mayflower Autonomous Ship (MAS 400)*. Rolls-Royce predicted fully robotic ships to become reality by 2020,” he added.



Artist impression

The fully-digital autonomous ship has been hailed as the new frontier in shipping by some commentators. The most commonly reported advantages of these vessels, according to Acciaro, include:

-  **Increased safety by means of eliminating human errors**
-  **Larger cargo capacity**
-  **Lower operating costs**
-  **The possibility to overcome skilled labour shortages**
-  **And eliminating the threat of piracy, as an unmanned ship would not be a profitable target**

Despite some compelling arguments for autonomous ships, Acciaro said he had some reservations. He said, “Labour cost reductions have also been mentioned, but any cost decrease claims, however, are questionable in view of the high cost of automation and, arguably, the need for onshore staff to keep the oversight of the autonomous ploughing of the oceans.”

While some of benefits might materialise, it is likely that their importance is overestimated, Acciaro claimed, especially in a situation where autonomous ships only exist on the drawing board.

Progress and technological innovation can take unpredictable pathways. However, the development of advanced technology could have positive benefits for companies who take up first-mover advantage, said Acciaro, as well as other economic spin-off benefits.

Echoing sentiments expressed by Rowe, Acciaro then warned, “The shipping sector and society, however, should also reflect on the desirability of the pursuit of such hyper-technological developments.”

He clarified his thoughts, adding, “The technological and legal complexity associated with the deployment of robotic ships is substantial. And the risks associated with automation in highly unpredictable environments are enormous, especially in view of the value of the onboard cargo and the catastrophic consequences of serious ship accidents.”

According to Rowe, autonomous shipping is currently not possible due to minimum safe manning rules and the inability of a vessel to berth itself. Also, there are rules in place at sea about deviating to assist/rescue other vessels, or people in distress.

“The whole rule book would need to be totally rewritten to allow autonomous ships and would require the collaboration and consent of the insurance industry,” he added.

The International Maritime Organisation (IMO), based in London, is the body tasked with coordinating uniform regulatory standards in the shipping sector. Torgeir Willumsen, Resident Partner, Simonsen Vogt Wiig, in a commentary published in *Seatrade Maritime News*, outlined some of the legal challenges presented by autonomous ships.

For instance, safety standards and conventions stipulate that “vessels shall be properly manned”, which is problematic under autonomous shipping where no crew are on board. Another area of uncertainty involves ‘rules of navigation’, which at present relate to the crew. Again, where there is no marine master this leaves an element of doubt in the present arrangements. Willumsen suggests that amendments will be required to place the duty on a different entity (other than the marine master of a vessel) possibly to someone else ashore. He also highlights possible complications involving collision avoidance regulations, which again involve a human element. Nevertheless, he believes that there is “conceptually nothing preventing an unmanned vessel from complying with such requirements”.

Willumsen also pointed out issues pertaining to liability regimes based on crew negligence. Due to the legal complexities involved with unmanned ships, he believes autonomous vessels will be deployed on a national or local level first, within coastal or inland waters, as national legislators operate on a faster timescale.

On the other hand, Rowe said, smart shipping allows many of the changes that are being mooted and within existing legal/rules framework.

“There are some potential issues of ‘deskilling’ or ‘reskilling’ certain personnel on board to allow them to perform the systems monitoring role and to work as part of the team in the new smart shipping environment. But those are changes which should be achievable with relatively modest changes to the rule book.”

Acciaro said, “Better working conditions on board vessels and making the maritime profession more attractive by means of better salaries could, for example, reduce the scarcity of skilled labour. Also, improving training, increasing crew numbers and the uptake of new technologies could reduce the incidence of human error, by limiting fatigue and stress.”

Peter Hinchliffe, Secretary-General of The International Chamber of Shipping addressed at a recent conference on the development of autonomous ships, as reported in *Lloyd’s List*. He said members of his organisation were not overly engaged in discussions on this issue, and that technological improvements should be harnessed to consider a future where many ships are still manned, to improve safety.



Artist impression

Dr Kirsi Tikka, Executive Vice-President of ABS Global Marine, said current vessels can benefit from improvements in technology and could be retrofitted.

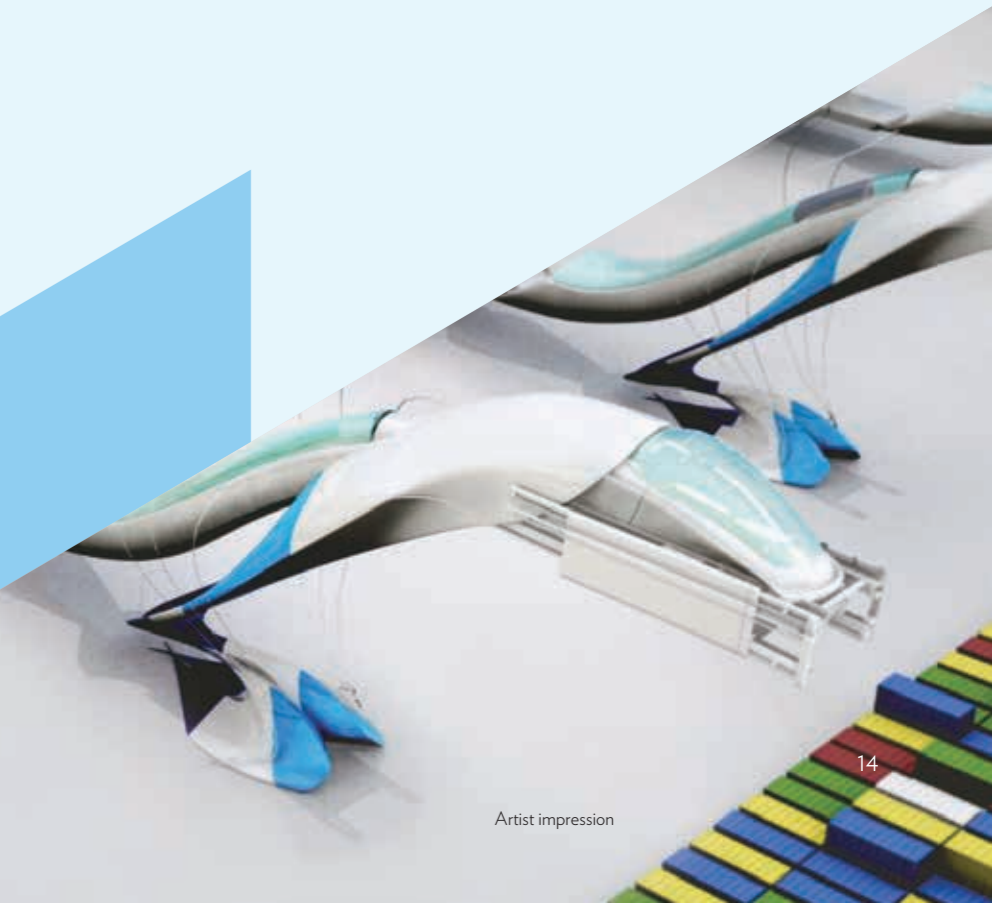
She assured shipowners that new technology being developed for autonomous ships could, in future, be implemented to new tonnage of 2020, and therefore this tonnage would not become obsolete by 2030. For Dr Tikka it is a question of balancing operational needs of today with future technological developments. She said the skills of master mariners and engineers will still be in demand in the future.

More generally, advances in shipping technology and reduced costs through containerisation have brought huge benefits to the shipping sector and international trade.

But Acciaro warned, “This cost reduction has not necessarily been associated with sufficient improvements in labour conditions. More than the pursuit of technology, those technological developments that can favour a rapid uptake to quality shipping seem still urgent and needed.”

“Many environmental issues associated with shipping, such as greenhouse gas emissions or ballast water, have yet to be resolved. It is time to start considering what technological priorities should drive the future developments of the sector,” he urged.

According to Rowe, smart shipping is likely to become a reality in the near to medium term. But for autonomous ships he forecasts that the developmental timescale will be “way off in the future”, if indeed they ever come about.



Artist impression



DRONES AND LANDING PLATFORM VANS

THE FUTURE OF DISTRIBUTION

In an exciting view of the future of urban e-commerce distribution and deliveries, Mercedes-Benz Vans, US drone developer Matternet Inc. and Swiss online marketplace Siroop have launched a project called 'Vans & Drones' in Zurich to test an efficient van and drone-based system for on-demand delivery of e-commerce goods.

The Zurich-based project will speed up and improve efficiency as the drones can land on the top of the vans at predetermined stations as the vans make deliveries. It cuts out the need to return to base to collect more parcels.

The next generation of trucks and vans will incorporate many new advanced features that will help to integrate package and freight deliveries in the air with road vehicles and distribution centres.

The project will see the use of beyond-line-of-sight drone operations using vans as landing platforms

in major urban areas, to test a fully-automated e-commerce drone network.

The drones are loaded directly by the merchant then fly to one of two vans equipped with precision-landing technology.

The van stops at one of four pre-defined points, called 'rendezvous points', within Zurich. The van driver takes the product and delivers it to the customer, while the drone returns to the retailer. The entire logistics chain from order receipt to customer delivery will be timed against conventional delivery methods.

In another initiative, Mercedes-Benz Vans has launched a pilot study for an emission-free interconnected 'Vision Van.' This is an all-electric vehicle which combines innovative solutions for last-mile delivery, as part of the company's adVANce initiative.



©Mercedes-Benz Van

In a global first, the van will digitally connect all people and processes involved, from the distribution centre to the consignee. The company also claims a first for the vehicle's fully automated cargo space and integrated delivery drones.

For example, if a parcel service provider stops his vehicle in a residential area, it will be possible to deliver multiple packages to nearby consignees autonomously by air – even if they are not at home – in addition to manual delivery.

This system is aimed at reducing delivery time and offers end customers new opportunities, such as same-day delivery at an agreed time. Mercedes-Benz Vans is forecasting that 'Vision Van' will boost efficiency by fifty percent on the last-mile deliveries.

The vehicle is equipped with a 75-kilowatt electric drive and has a travel distance range of up to 270 kilometres (km). With the Vision Van, deliveries are emission-free. These solutions can make the transportation of goods and passengers even more efficient and open up new business opportunities and economic benefits for customers.

By 2030 two thirds of the world's population will live in urban areas and there will be increasing demand for transportation solutions, that are faster, more efficient and environmentally friendly.

MEDICAL DRONE NETWORKS LEAD WAY FOR COMMERCIAL OPERATIONS WAREHOUSE MANAGEMENT

John Walker, a Lancaster, Pennsylvania based aerospace consultant who spent 32 years at the Federal Aviation Administration (FAA) before co-founding the Padina Group, Inc. in 2006. Walker believes early public acceptance of drone delivery networks in urban areas will revolve around hospitals. "Once drones can safely and reliably carry emergency medical supplies, it will pave the way to other kinds of drone deliveries. That linear network where drones can operate between hospitals would also have Amazon and anyone else that could meet the requirements to operate," said Walker in an article published on the United States (US) National Public Radio (NPR) website.

Several companies have approached governments in developing countries about operating medical deliveries using drone services in regions with poor road transportation infrastructure and remote areas.

In late 2016 Zipline, a San Francisco Bay Area-based robotics start-up, set up distribution centres in Rwanda, where its drones have made more than 1,400 flights carrying on-demand emergency medical supplies over 99,000 kms as of autumn 2017. This year the company will expand its medical delivery operations by launching a second base in Rwanda and new services to neighbouring Tanzania.

The new Tanzania venture involves more than a thousand health facilities aiding 10 million people in remote and hard-to-reach areas.



The Tanzania service will include blood pack as well as emergency vaccines, medicines and emergency supplies like sutures and IV tubes. They will be delivered by an all-new fleet of fixed-wing drones, or 'zips'. These are hauling two kilograms of cargo and travelling 160 kilometres per round trip. According to Keller Rinaudo, Zipline's CEO, delivery costs will be roughly on par with traditional transportation.

Such efforts face tougher hurdles in the US where aviation regulations are strict and limited for drones to fly into already congested national airspace. "We haven't seen the FAA interested in a one-off approach," said Susan Roberts, co-founder of AiRXOS, a General Electric subsidiary focused on drone infrastructure technologies.

TRUCKING AHEAD

Driverless trucks could be a feature on many roads in the next ten years, according to José Viegas, former secretary-general of the International Transport Forum (ITF) a think-tank linked to the Organisation for Economic Co-operation and Development (OECD).

In an article published in an *FT Transport and Logistics Special Report*, he said trials of automated trucks are underway on public roads in Europe and the US and that some governments are reviewing their laws and regulations.

The idea of a fully laden truck travelling at 100 kilometres per hour on a highway, with a computer controlling the vehicle, still causes concern in many quarters.

However, the latest technology is designed with safety at its core. This includes advanced features that can brake the truck automatically for objects, including pedestrians, as well as lane departure warning, fatigue detection and adaptive cruise control.

The next phase of development is to introduce technology that assists drivers and allows more efficient operations, optimising fuel consumption by controlling the speed of the vehicle. Work is also being carried out on technology that allows for 'platooning' whereby a number of trucks from the same company synchronise their braking on highways to drive closer together to reduce air resistance and improve fuel efficiency.



Drivers then take over when there is a junction and can separate the vehicles to enable each truck the transit individually. The technology will also enable the trucks to "communicate" with each other to synchronise speed and positioning to 'platoon' effectively. Sensors will also be fitted to trailers so they can detect other vehicles behind and operate the truck's self-driving system.

The nascent technology is already in commercial use with companies such as Mercedes-Benz and Volvo leading the way. In Sweden, Volvo has a driverless truck operating in a mine in Kristineberg. It has also tested a driverless vehicle in China that drove between delivery hubs on public highways.

For Mercedes-Benz its technology assisted vehicles are already on the road, allowing hands-free operation by drivers. "Our trucks can automatically speed up or slow down depending upon traffic conditions and the driver is not required to brake or accelerate. These trucks can brake for hazards automatically and they can warn a driver if he or she has wandered out of the lane, while the automated transmission takes care of all the gear changes," said Daniel Whitehead, Managing Director of Mercedes-Benz Trucks and Vans, Australia/ New Zealand.

The trucks of the future will also have to meet increasingly tough environmental emissions standards, imposed by national and regional authorities worldwide in order to tackle pollution. The latest Euro 6 standard reduces particulate matters by 99 percent and nitrogen oxide levels by 97 percent.

OIL PRICES RISE THREATENS BOTTOM LINE

Inflated crude oil prices places added cost burden to transportation sector – but volatility remains.

Transportation enterprises are having to cope with a long subdued but now rising cost burden: the rapid upswing in oil prices since mid-2017. For some businesses involved in transportation, how they cope with this latest swelling of a major input cost could make or break their profit.

The main factor behind the uplift in oil prices is the ongoing limit to production by the 14 member countries of Organization of the Petroleum Exporting Countries (OPEC), after prices had fallen to below US\$50 per barrel, as reported by the BBC. Their policy to restrain production and inflate prices bore results and the price of crude oil has even nudged above US\$67 per barrel in recent months, the highest for many years.

Crude oil is the most traded commodity in the world and some analysts have noted increased volatility in oil prices in recent years. Whether OPEC's unified stance to limit output holds up remains to be seen, plus throw in American shale oil production, the value of the US dollar exchange rate, numerous geopolitical tensions, and it is impossible to forecast the direction of prices with too much certainty.

For instance, Eugen Weinberg, Head of Commodities research at Commerzbank, anticipates some market correction, and suggests American producers will react to the price rise by inflating production, which will ultimately destroy OPEC's pricing strategy, as reported by oilprice.com.

The *Wall Street Journal (WSJ)* recently speculated that the announcement by the International Energy Agency (IEA) that a spate of American shale oil flooding the markets during 2018 could jeopardise the recent recovery in the oil price. American shale output growth is so rapid it could absorb any increases in global oil demand. Growth in shale oil production in the United States may offset supply restrictions in other parts of the world, claimed the *WSJ*. The IEA Report predicted American oil output would reach a record of 11 million barrels per day by the fourth quarter of 2018.

Some analysts suggest market fundamentals point to higher oil prices sustaining in the short term. However, given the volatility of commodity markets, the trajectory trend of prices is uncertain. Indeed, the IEA warned of a "volatile year" ahead for oil prices, as reported in the *Financial Times*.

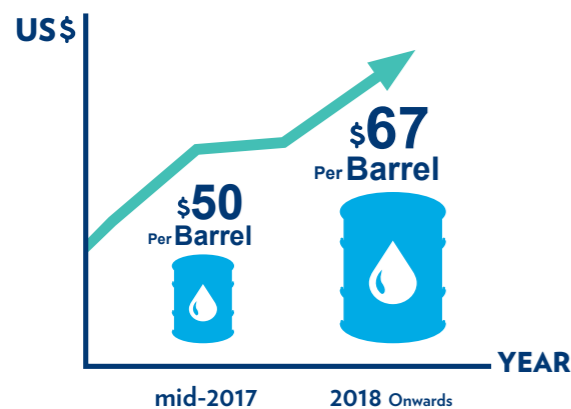
Crude prices rose by around 50 percent in the second half of 2017 – but its future direction is uncertain. *The Economist* claimed that OPEC is working on a plan for a tie-up with ten other oil-producing countries, including the huge petrostate of Russia. This alliance would be designed to shore up the oil price by manipulating output. As ever, the oil markets are a high-stakes game of brinkmanship played out by countries endowed with huge quantities of hydrocarbons.

However, what is certain is the impact of rising oil price during 2017 has eroded the profitability of ocean liners, as they may have limited ability to hedge against the risks, according to Trevor Crowe, Director, Market Research, Clarkson Research Services Limited.

He explained, “Whilst liner companies may have some hedging mechanisms in place, these operations are still largely exposed to changes in fuel prices to one degree or another.”

He said the rising oil prices during the latter half of 2017 will have had an impact on profitability. However, the situation is complicated by the fact that many liners raised their freight rates during the year.

He added, “The general feeling is probably that overall year-on-year increases in freight rates (2017 averages were up on 2016 averages despite an easing back on some routes as the year progressed) had a positive impact on liner company profitability, a portion of which was eroded over time by year-on-year increases in bunker costs.”



One massive development related to oil with implications for the transportation sector is the announcement by Chinese authorities of The Shanghai International Energy Exchange, as reported by oilprice.com. This will allow Chinese and overseas oil traders to buy and sell oil futures contracts in China’s domestic currency, the Yuan.

Currently, China is the world’s largest importer of oil and this latest move would allow Chinese businesses to become major players in oil trading, including transportation businesses, as Martin Rowe, Managing Director of Clarksons Platou Asia Limited, explained.

“Chinese authorities recently announced that they will allow state-run companies to become involved in oil and oil products hedging (futures) – something that, until now, has been prohibited,” said Rowe.

“It will be interesting to see if companies such as COSCO will get involved in schemes to hedge their bunker costs given the very real prospect of firming oil prices,” he added.

Peter Sand, Chief Shipping Analyst of Baltic and International Maritime Council (BIMCO), the largest maritime trade group in the world, recently suggested that to improve earnings container liners must rein in on costs and continue to operate slow-steaming to limit fuel costs (*Seatrade Maritime News*).

How logistics businesses handle fuel price increase depends on numerous factors, according to a report by the European parliament called ‘The Impact of Oil Prices Fluctuations on Transport and its Related Sectors’. The analysis highlights that the different modes of transportation and logistics operators are affected in different ways by higher oil prices. This depends on their reliance upon petroleum products; plus, their ability to pass on costs, which is determined by market power.

According to Dr. Yip, Associate Professor, Department of Logistics and Maritime Studies at the Hong Kong Polytechnic University, many factors operate to determine fuel prices: namely, crude oil price, refinery operation, fuel stock levels, delivery practice and geo-political issues. He said the most difficult developments to predict are geo-political issues.

Yip stressed that when considering the marine sector, one of the most important cost components for ship operators is the cost of fuel oil in terms of marine fuel and marine diesel oil. Fuel cost, on average, accounts for 40 - 60 percent of the total voyage cost which, in turn, represents around 40 percent of ship operation costs.

“As a result, sharp and unanticipated changes in fuel price have a major impact on the operating profitability of ship operators. This is because fuel price is related to world’s crude oil price, which has been shown to exhibit substantial variability in both the short and long term,” said Dr. Yip.

As for all players involved in the transportation sector, Yip stressed the utmost importance for ship operators to monitor and manage the risk exposure to fuel market fluctuations, to maintain their operating profit.

He explained how fuel price risk management is a continual cyclical process, which includes risk assessment, risk decision making, and the implementation of risk controlling strategies and measures.

Yip added, “Hedging is one of the most common risk management strategies using financial derivatives to hedge against the future movement of fuel prices. Alternatively, risk control strategy is another possible and practical option, including ship and engine designs, operating speed, ship replacement policy, agreement with fuel suppliers, and the logistical arrangements for fuel replenishment.”



BLOCKCHAIN

THE NEXT GAME CHANGER?

The advent of blockchain trials by Maersk, Walmart and IBM has raised the stakes for this disruptive technology to be a major game changer in the global supply chain.

While the first steps are taken to develop, fine tune and stress test the technology, it is worth stripping down blockchain to have a look at how it works, what it does and why it is so important.

Blockchain will have a far-reaching impact on banking, law, government, and especially on global supply chains. Perhaps its biggest opportunities lie in the many intractable problems at the heart of global supply chains.

A large number of trials have been conducted in the last 18 months. While the detailed feedback of most has not been released, the follow-up activity indicates that participants have been satisfied that the results support further involvement.

Walmart has heavily engaged in food safety-related trials. One such extensive trial, involving mangoes, found the time it took to trace back a single packaged sliced mango to source was 'six days, 18 hours, and 26 minutes'. The same exercise using the blockchain-based system took 2.2 seconds.

Walmart has extended its involvement in blockchain projects. Together with IBM, Chinese retailer [JD.com](#) and Tsinghua University, a public research university in Beijing, they have formed the blockchain Food Safety Alliance. This develops a 'standards-based method' of collecting data related to food origin, safety and authenticity, according to [Forbes.com](#).

LEADING THE WAY

Maersk has been the most active and high-profile logistics provider testing out blockchain. The global shipping giant has conducted trials with Schneider, Dupont, Dow Chemical, Tetra Pak (as well as their original, well documented trial on flowers from Kenya to the Netherlands in mid-2016). The results of these were sufficiently convincing for Maersk and IBM to form a new joint venture to further develop blockchain solutions.

One of the key challenges identified by Walmart and its partners is the need for standards and protocols. Large influential players (such as Walmart and JD.com) are needed to drive this development. Trusted bodies and certification processes are needed to provide assurance that records captured on the blockchain are accurate.

Packaging also becomes a key focus to carry this assurance through to the consumer. Tamper-proof packaging has not been a big focus in the fresh food trials to date but must be if the full potential of blockchain is to be realised.

Many of the trials focus on relatively discrete single-source products such as fresh fruit, pork, wine or finished consumer products. Tracing all inputs to more complex assemblies, or fresh products with multiple sources (e.g. a jar of mixed spice) is expected for the next generation of trials.

One technical challenge - the speed of transactions - is still being worked upon. The speed of transactions (related to the decentralised network where every node needs to process each transaction), is still a potential constraint to widespread use in the supply chain. 'Several seconds' is often quoted as the time to process a transaction (which varies significantly across the current providers).

NEVER BREAK THE CHAIN

In supply chain terms, relationships traditionally occur between each adjacent party in the chain, while banks have arrangements with specific parties. The key game changer is in blockchain's enablement of many parties in a chain to access all information embodied in the transactions without the need for a trusted third party while existing relationships remain unchanged.

Blockchain also supports other supply chain functions, such as improved work flow and 'smart contracts'. A smart contract is a digital mechanism for self-executing and self-enforceable contracts.

The developments that allow smart contracts have progressed in parallel to the technology that enables blockchain. Nick Szabo, a US legal scholar, computer scientist, and cryptographer is famed for his research in digital contracts and digital currency. Szabo developed the phrase and concept of 'smart contracts' to enable digital, legal and financial transactions to be available on the internet.

A smart contract defines the rules and penalties associated with an agreement and enforce those conditions. Thus, when a container is delivered to the customer at a certain destination, payment from customer to supplier is automatically triggered through the specified bank. If the order is delivered late, this payment, according to the terms of the contract, could be discounted according to the set of rules and penalties set.

Key benefits stemming from smart contracts and blockchain are efficiency gains and reduced costs of conducting transactions, particularly those associated with the transfer of ownership of goods or assets. For importers and exporters, faster and easier cross-border movements are envisaged by replacing manual documentation flows and slow, cumbersome international payments practices such as letters of credit.

Another key benefit is traceability – the ability to capture real-time information about the origin of a product or material, and its physical condition and location at any time along the supply chain. Once captured, a record cannot be altered. This secure history and record-keeping aspect is known as the 'immutable record' feature. Blockchain could also capture 'certification' of the origin of sensitive materials (e.g. palm oil).

Traceability is a benefit attracting considerable attention from agricultural businesses. Assuring retail customers and consumers of the source or 'provenance' of their beef, canola, fish or infant formula, has considerable appeal. This is expected to provide early adopters of the technology with tangible commercial advantage, especially in premium markets and in markets such as China where food safety has been a concern.

Whenever a quality problem does occur, fast and targeted recalls can be initiated. This is one of the key drivers for Walmart's interest in blockchain. Walmart is currently tracking pork shipments within China and produce from Latin America to US markets.

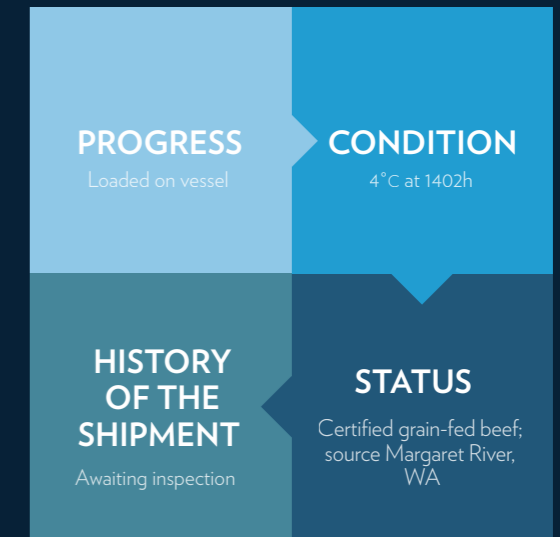
CONNECTING TO THE IoT

Blockchain's ability to enhance traceability and quality management is supported by parallel developments in the Internet of Things (IoT). Location and temperature information related to the transit of a shipment (and each unit within) could be captured and communicated at regular intervals. Blockchain provides a means for this data to be recorded securely, in a standard format, and accessed by approved parties in the chain.

END-TO-END VISIBILITY

Information about a shipment would be captured in real time based on specified events, documents, IoT data, approvals and certifications.

Each participant in the supply chain ecosystem can view its progress, condition, status and history of the shipment.



Some information would be based on their level of permission. No party can change or delete a record without the consensus from others on the network, thus ensuring the integrity of the data.



GLOBAL MOMENTUM

Blockchain technology is gaining considerable momentum across the globe, with significant investment occurring, and many start-up companies working on specific aspects of distributed technology (the generalised version of blockchain). IBM has been a key driver, and is the most prominent company in terms of supply chain. IBM has been conducting trials jointly with Maersk, the world's largest shipping company.

An IBM and Economist Business Unit study of 200 banks in sixteen countries indicates that 66 percent of banks will have commercial, scaled blockchain solutions in place by 2020.

IBM alone has 400 clients who are testing blockchain, and 650 staff dedicated to its development. Microsoft is partnering with JPMorgan Chase and several other large corporates on competing software to IBM's. There are also smaller software providers emerging.

STRESS-TESTING TRIALS

The format for investigating the applicability of blockchain in any industry or situation is following a similar path: research across the relevant supply chain; selection of a group of participant organisations along the chain; and then trial shipment(s) to understand the technical feasibility and to assess the benefits. Maersk and IBM have piloted flowers and electrical parts, and Walmart have followed this path with pork and produce trials. There are several start-ups focused on agricultural traceability and provenance, conducting trials on specific fresh products such as fish and wine.

Others are taking a big-picture view: Australia Post is assessing blockchain as a solution for digital identities and is working with Alibaba to explore ways to use blockchain and other technologies to reduce food fraud in China. BHP Billiton has announced that it will use blockchain to securely record and track key sample data in its mining processes.

Pacific International Lines, PSA International and IBM Singapore will collaborate to test blockchain technology to achieve enhanced security, efficiency and transparency in supply chain networks, according to *Seatrade Maritime News*.

EXPECTED TIMESCALE

The biggest barrier to the widespread adoption of blockchain is governance. Hidden under the covers of the internet are several official bodies that have created standards and protocols about how we all access and use the internet. Similar protocols are needed to support widespread adoption of blockchain. There is little doubt that this will happen soon, with some pundits suggesting a 5 to 10 years' timescale before usage moves from the trailblazers to more widespread adoption.

The potential advantages for global supply chains are massive. It is estimated that up to 20 percent of the cost of global transport costs are associated with document processing and administration. Then there is the inventory cost of containers and air shipments awaiting clearances, and the cost and revenue impact of recalls.

Earliest adopters are expected to be industries that gain most by adding value to their product and reducing risk, such as agriculture.

Unlike big IT projects of the past, no one is 'betting the house' on their blockchain decision – at least at this stage. Most blockchain applications are following the innovation playbook – using trials and feasibility studies; low commitment, low risk, step-by-step assessments. Considering the potential for improved efficiency, reduced risk and finally being able to operationalise the 'end-to-end' supply chain, this is a digital initiative that deserves a closer look.

Contributor - Deborah Ellis - Partner, Gattorna Alignment



WHAT IS BLOCKCHAIN?

'Blockchain' refers to a distributed or shared ledger that can store the history of transactions conducted between organisations, and which can potentially be viewed by all the parties involved in the transaction.

The naming of this technology is a perfect visual metaphor for its technical operation. As each transaction occurs, it becomes a 'block'. Each 'block' is connected to the one before in an irreversible chain over time – hence 'blockchain'. A key strength of the blockchain is its trustworthiness. The blocks are simultaneously recorded on many servers. This wide distribution of information is more secure than single instances of data.

Blockchain technology is based on the same concept of security and validity underpinning Bitcoin, the cryptocurrency, where distributed computers capture identical information.

EARLY ADOPTERS CAN GAIN COMPETITIVE ADVANTAGE

Blockchain will initially be used in product categories and market segments where provenance and quality are a significant part of the value assessment by the customer. Products such as airline parts, high-end wine, infant formula and branded fresh products with quality claims (e.g. grass fed, organic beef) are usually targeted to customers who value confidence in the source.

The other advantage is risk minimisation considerations. A quality issue with a fresh product can undermine whole industries. A fast, targeted recall can reduce the impact on customers, but can also reduce the reputational damage. The mad-cow and horsemeat scandals that took years to recover from illustrate the scale of damage.

NEW HORIZONS

FOR HUTCHISON PORTS THROUGH JOINT VENTURE WITH TMA LOGISTICS

Hutchison Ports' new joint venture with TMA Logistics will offer a mixture of services initially within the Netherlands, the UK, Scandinavia & Baltic countries.

In the longer term there are plans to extend services from Amsterdam and Northern Europe into Southern and Central Europe utilising barge operations, rail freight and last-mile trucking.

The new JV will provide a broad range of services including warehousing, customs, stevedoring, commodities, cargo checking, and barge operations.

"In order to reduce the CO₂ emissions and carbon footprint for cargo shipments, TMA Logistics is working more with customers to leverage Europe's extensive canal network and railways."

"The partnership will be based on a platform where we can leverage both the terminal and our logistics network and operations across Europe," said Gerben Matroos, Managing Director of TMA Logistics.

One of the key strengths of TMA Logistics' is its operation from the Hutchison Ports' terminal located in Amsterdam, which is a multipurpose terminal.

"We have the flexibility to handle all kinds of cargo including Project, breakbulk and containers and containers will be one of the main areas for development. Of course, with our global network of ports, many carriers have an existing relationship with Hutchison Ports and now they are interested in the services we can provide at Hutchison Ports Amsterdam."



"The terminal will offer more dynamic operations following the joint-venture agreement with Hutchison Ports, it is expected to see more cargo-handling activities and a significant increase in volume during the next year, a mutually beneficial position," said Matroos.

One plan is to connect the terminal to Southern Europe via rail to reduce the reliance on trucking. This is in response to the European Union and the Government of the Netherlands both looking to reduce CO₂ emissions and carbon footprints.

"We are hoping to use trucking for the final leg of delivery at local level, reducing congestion on the roads and emissions. By putting cargo on barges or ships for short-sea sailings and on the railway we will support environmental improvement initiatives in Europe" said Matroos.

Companies across Europe are working to comply with rules laid out in The Paris Agreement, which within the United Nations Framework Convention on Climate Change is dealing with greenhouse gas emissions mitigation, adaptation and finance starting in 2020.

The two companies complement each other in many ways, explained Matroos, "Hutchison Ports operates container terminals and handles millions of containers, while we at TMA Logistics are interested in what is inside the box, the actual cargo. We can then help the shipper, by utilising our warehousing, distribution networks as well as transportation solutions to deliver one-stop services."

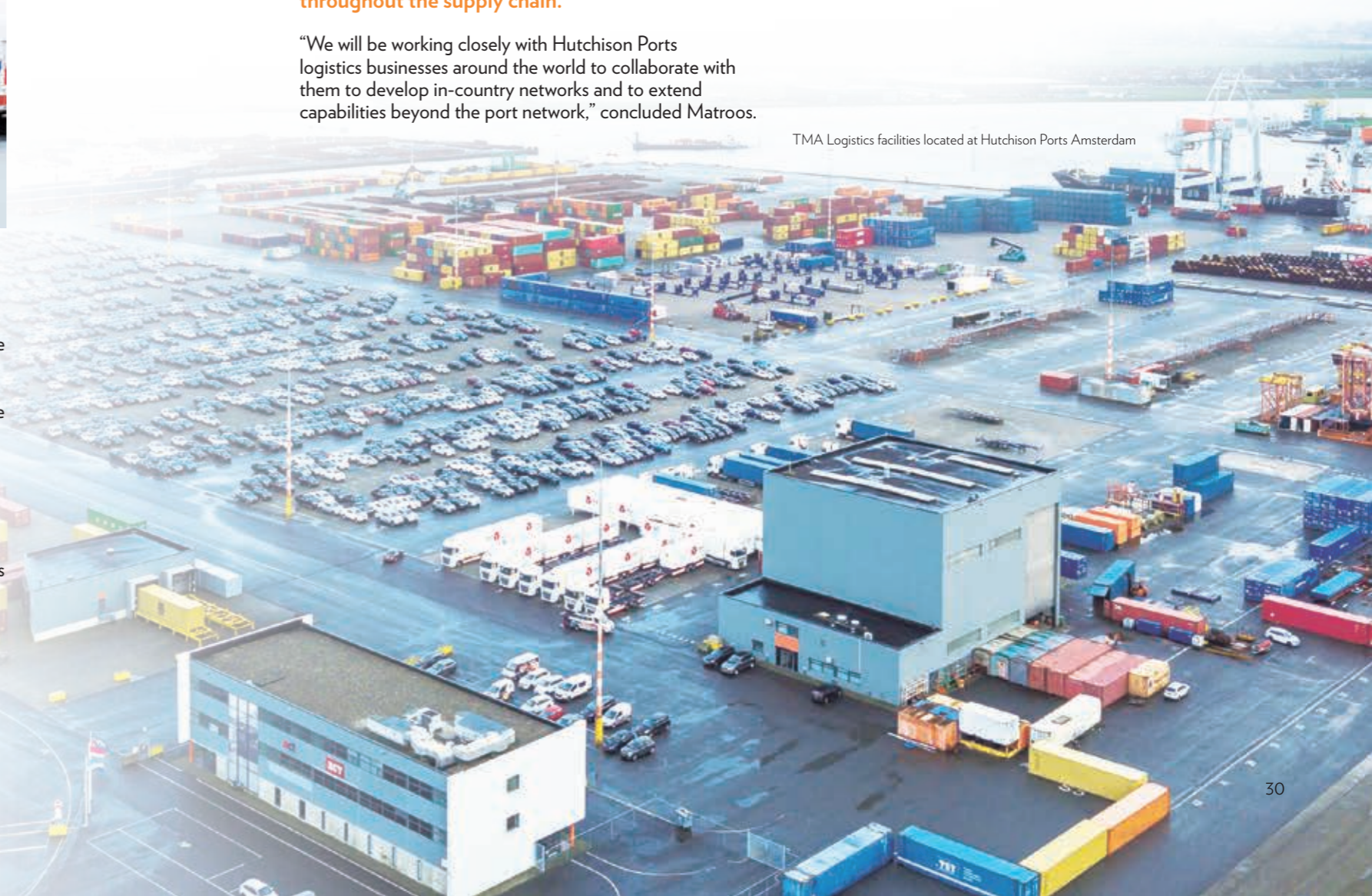
Currently TMA Logistics handles products that range mainly from seed potatoes, steel, plastics, solar panels and starch.

"We have a very large global client database in Europe, the Middle East, Asia and South America with a broad range of products. And now through Hutchison Ports' global network of ports it provides us with even more opportunities to grow the logistics business throughout the supply chain."

"We will be working closely with Hutchison Ports logistics businesses around the world to collaborate with them to develop in-country networks and to extend capabilities beyond the port network," concluded Matroos.



TMA Logistics facilities located at Hutchison Ports Amsterdam



REMOTE-CONTROL YARD CRANES

RECONFIGURED RTGCS TO BOOST CT9 PRODUCTIVITY



REMOTE-CONTROL YARD CRANES SET TO BOOST OPERATIONAL EFFICIENCY AT CT9

Twenty-nine reconfigured Rubber-Tyred Gantry Cranes (RTGCs) have been installed at Hutchison Ports' HIT Container Terminal 9 (CT9) North. They are eventually expected to see productivity gains rise 30-40 percent with higher operational efficiency up by 20 percent.

These next generation RTGCs at CT9 are using remote-control technology which allows trained personnel to operate the equipment from an air-conditioned office, providing improved safety, better working conditions and higher productivity.

The operator does not have to spend time walking to and from the crane which is safer and cuts exposure to extreme weather conditions. The more appealing working conditions are expected to attract new talent to HIT and the company is offering training programmes to boost recruitment.

Operators can load and unload containers from trucks and position them in the yard from the comfort of an office. The cranes are installed with high-definition cameras and sensors enabling the operator to work with precision from a remote location.

These reconfigured RTGCs will help manage the large increases in cargo moving through the yard generated by modern container mega vessels of up to 20,000 TEUs calling at the terminal.

The yard transitioned from a manual system to a remote control while maintaining operations, which is a world first. At the same time a new automated container stacking system was introduced, further boosting efficiency gains.



Remote Control Centre at CT9

GERRY YIM, MANAGING DIRECTOR OF HUTCHISON PORTS HIT SAID:

The remote crane operations can bring four benefits, namely:

-  Improved working environment for crane operators
-  Increased industrial safety
-  Higher operational efficiency and productivity
-  Cleaner terminal environment by reducing carbon emissions

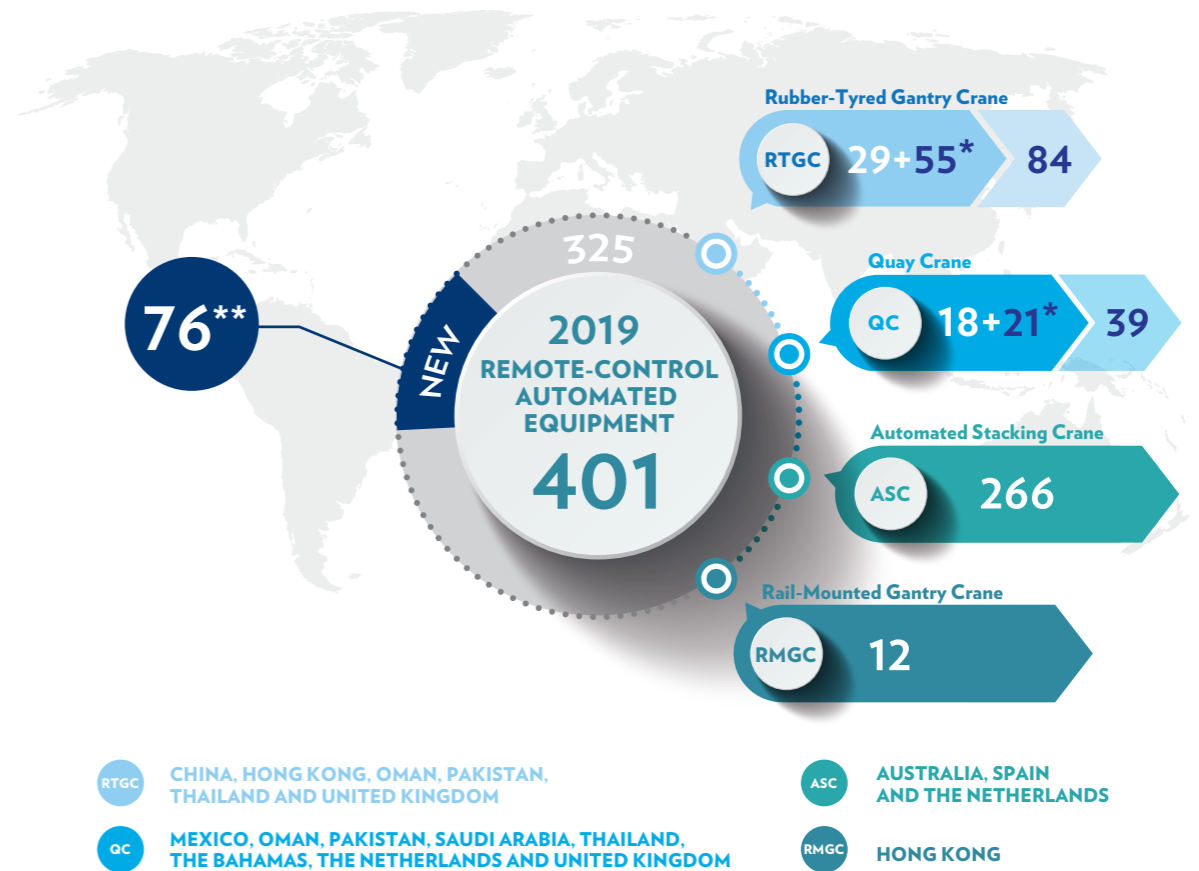
Yim concluded, "The transition to remote operations can enhance the overall operational efficiency and competitiveness of terminals in Hong Kong, which will maintain the city's status as a major transshipment port."

SIMON WONG, GENERAL MANAGER-ENGINEERING OF HUTCHISON PORTS HIT ADDED:

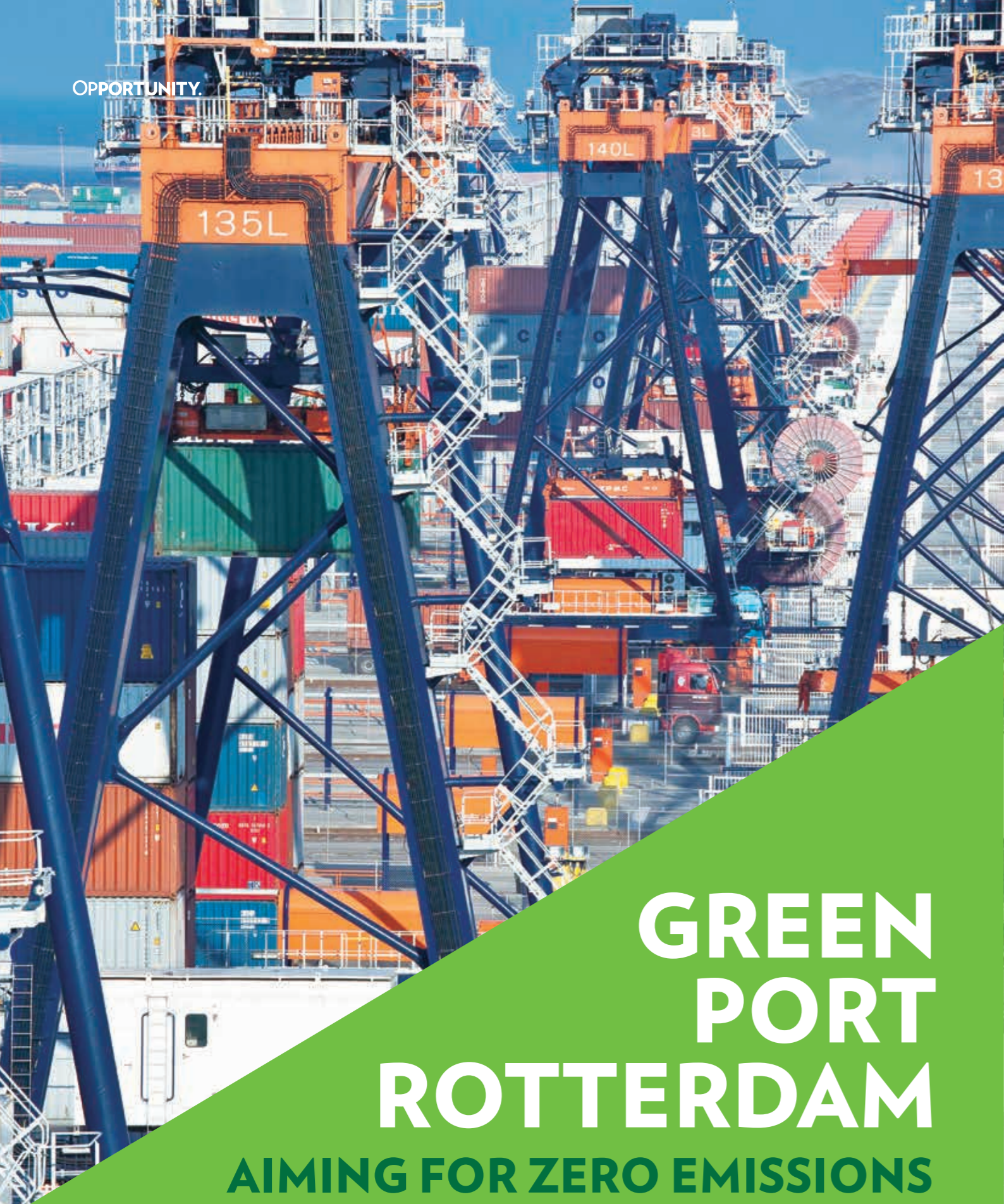
"The main challenges to overcome included ensuring that the ground surface in the container yard was perfectly levelled so sensors could accurately position the RTGC for a safe load and unload cycle. There are plans to replicate similar remote-control systems to other HPH Trust container terminals."

IMPROVING EFFICIENCY AND PRODUCTIVITY WITH AUTOMATED STACKING CRANES

To date, Hutchison Ports operates 325 units of remote control/automated equipment with automated operational system enhancing efficiency and productivity. A fleet of approximately 76* units of remote control equipment will be added to the group's network of ports by 2019.



**No. of remote-control equipment subject to change.



GREEN PORT ROTTERDAM

AIMING FOR ZERO EMISSIONS BY 2050

The Port of Rotterdam Authority aims to be a zero emissions port by 2050, and remains confident about achieving its goal of releasing “next to no emissions” by then.

Remco Neumann, Corporate Social Responsibility Manager at the Port of Rotterdam is focused on making the changes happen.

“It’s realistic to expect that industry and logistics will be virtually – or by that time, even entirely – zero emission and silent. We presently recognise that growth in the industrial era has had several undesirable side effects. In 2050, I believe there will be no more noise pollution or air pollution and no negative environmental impact. There’s a growing awareness that it is necessary, and indeed possible, to make this transition,” said Neumann.

However, he recognises that much still needs to be done. **“Only six percent of our operations in the port and the Netherlands, as a whole, are powered by renewable energy. But this is set to increase exponentially.”**

Neumann is confident that the twin drivers of technology and the societal shift to make sustainability the norm will satisfy growing demand for clean energy.

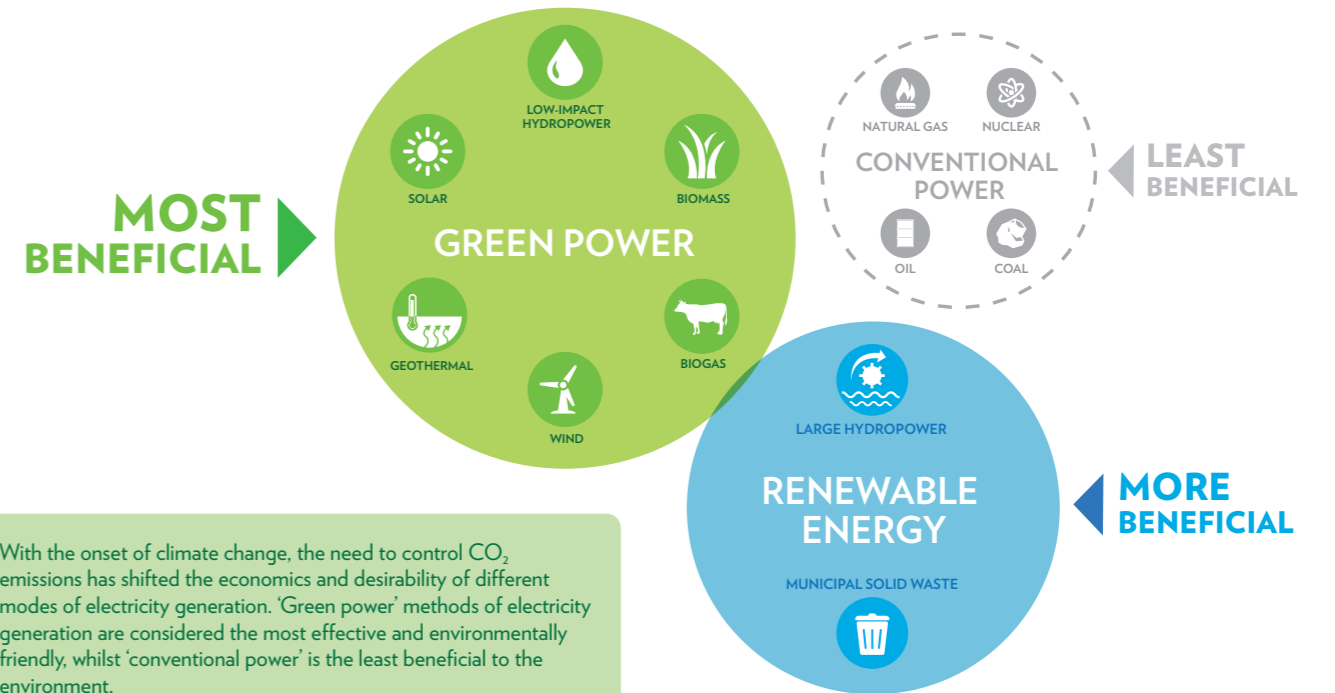
“This sustainable society is going to happen anyway, so you had better become an active part of the transition. Which is exactly what we’re doing as the Port of Rotterdam. In the port, you can already find fully electrical container terminals and hybrid vessels, the

re-use of residual heat and Carbon Dioxide (CO₂) and a rapid increase in the use of solar power. The port area already accommodates 1.6 megawatts of generating capacity. This is expected to increase ten-fold before the end of 2020.”

The port operates a sustainability programme and integral to this is ongoing dialogue with companies based in the port. A recent project was an incentive scheme for ‘Clean Inland shipping and sustainable logistics in Rotterdam’. This offers financial support to new projects that result in reductions in fuel consumption, greenhouse gases and air emissions by inland shipping.

Rotterdam, along with Amsterdam and Antwerp, is to host the first fully electric emission free barge, a Port-Liner vessel, and which will operate between De Kempen intermodal terminal in South Netherlands and Antwerp, as reported by *The Loadstar*.

The Port of Rotterdam also recently signed a development agreement for the initial investments in an advanced waste-to-chemistry plant in Rotterdam. Other companies in the consortium include Air Liquide, AkzoNobel Speciality Chemicals, and Enerkem. The aim is to convert plastic and mixed waste into new raw materials for industry. A reduction of CO₂ emissions (by about 300,000 tonnes) is a main goal of the project. The Mayor of Rotterdam City Council recently said that fossil fuel cargo types will be phased out. They will be replaced by sustainable energy and new markets, as reported in *Port Strategy*.



With the onset of climate change, the need to control CO₂ emissions has shifted the economics and desirability of different modes of electricity generation. ‘Green power’ methods of electricity generation are considered the most effective and environmentally friendly, whilst ‘conventional power’ is the least beneficial to the environment.

Other green initiatives include a discount of up to 20 percent on port duties for sea-going vessels that comply with standards above the statutory requirement. The Port Authority is also collaborating with other interested parties to construct a pipeline as part of its carbon capture and storage intentions.

Leo Ruijs, CEO of Hutchison Ports ECT Rotterdam, strongly backs the Port Authority in this sustainable vision, but admits many challenges lay ahead. For the port to achieve these reductions, carbon capture technology must prove effective. This is because the Port of Rotterdam focuses on zero emissions to the petrochemical industry and the energy sectors, both are huge in Rotterdam and primarily based on fossil energy resources.

“For the whole port it depends on many aspects, whereby an important element will be the reduction of CO₂ emissions by storing it underground,” Ruijs said.

He thinks the Port of Rotterdam’s earlier target of a 49 percent reduction of emissions by 2030 (compared to 1990) is feasible. This aim is part of the objectives of the Paris Climate Agreement.

“It is achievable in the container sector, but challenges the industrial sector. It really asks for a different mindset. However, the Managing Director of Havenbedrijf Rotterdam NV (Rotterdam Port Authorities) is determined to set the scene in achieving this ambitious goal,” he added.

Other ports around the world have adopted emissions reduction strategies, such as the Ports of Los Angeles and Long Beach. However, ambitious targets of achieving zero emissions by 2030 have drawn some criticism from the President of Pacific Merchant Shipping Association, John McLaurin (as reported by *Port Strategy*).

McLaurin warned that stringent environmental regulations could draw shipping trade away from West Coast ports. He called for a more holistic approach to environmental management. McLaurin cited funding shortages, a lengthy permitting process and technical deficiencies as major obstacles to progress. He also

believes the compliance timescale is unrealistic and that fines could be imposed on ports for situations over which they exert little control, such as customer emissions.



Lean and Green Award

The Port of Rotterdam has already achieved a high degree of sustainability, according to Ruijs. ECT Rotterdam has been recognised for achieving several milestones in reducing its carbon footprint. A Dutch public-private programme on “Lean & Green” has awarded ECT with a number of Lean & Green star awards for its greener logistics efforts. Award winners pledged to reduce their CO₂ emissions by at least 20 percent over five years.



Hutchison Ports ECT Euromax AGV

Ruijs said that, “Most equipment on our ECT Euromax terminal is powered by electricity instead of diesel. The terminal has achieved a number of milestones in reducing its carbon footprint.”

He added that ECT Rotterdam is continuously investing in more sustainable equipment plus reviewing other aspects of its operations.

“Our latest Automated Guided Vehicles (AGVs) are hybrid, most of our equipment, especially on the ECT Euromax terminal, is powered by electricity. In my opinion, we are one of the front runners in this respect in the Port of Rotterdam,” said Ruijs.

There is potential for global ports to reduce emissions from their operations. Kalmar recently released a White Paper on reducing air emissions in a container terminal. The paper outlines how electrification, hybrid technology and energy regeneration can significantly reduce emissions. One of the challenges is fitting new technology to reduce emissions on brownfield land, where terminals are located.

“You have to fit new technology in an existing operation, which is more difficult than a greenfield situation. Therefore we want “sustainable” investments to follow the pace of our regular investment plan to keep it economically viable,” explained Ruijs.

He believes it is an asset to be viewed as a ‘green’ terminal. “It makes commercial sense for Hutchison Ports when it can align its investments with this goal in mind,” said Ruijs.

He concluded, “There is still a lot of inefficiency in the supply chain, especially in hinterland transportation. Reducing inefficiency helps to control emissions. The transportation services of ECT Rotterdam, under the brand of European Gateway Services and its extended gates, will not only help us to achieve the required emission reduction, but could still support the whole logistics chain better than today with more efficient transport over water and rail instead of by road.”



HCT AMSTERDAM

- 25 HA PROJECT AREA
- 1.000M QUAY SIDE
- 15M DRAFT
- WAREHOUSE AND OFFICE
- CRANES AND EQUIPMENT
- OWN EXPERIENCED STAFF

**ISPS CONTROLLED
TERMINALS**

**24/7 STORAGE
FACILITIES**

**IN AMSTERDAM
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