

no. 1/2018 (4)

ISSN 2449-6030

Harbours review

ports & shipping
technology
Legal

All over the world – HaminaKotka

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dear readers,

Welcome to the newest printed edition of the *Harbours Review*, your go-to source of the latest intelligence on the European and global transport & logistics industry. Once more we've gathered a set of articles in one place, a genuine cream of the crop, to give you an overview of the most topical issues currently moulding the business of moving objects and people from one place to another.

Specifically, we've put a spotlight on the themes of ports & shipping and technology. Additionally, there's a smaller, yet highly valuable section on legal matters, like Brexit, international trade sanctions, and cyber. The main parts couldn't be much more diversified, as we've got pieces on the up-to-date state of the European seaport industry, including EU state aid and what Artificial Intelligence has to do with port operations; how harbours can adapt to climate change and make money out of waste; on the sea traffic management and the proposal of a global ship speed reduction scheme (and why it might not work); why the maritime business has to adapt in order to attract, hire, and keep the best talent – also from the born-digital millennial generation; why, according to some, the transport & logistics industry is “dumb, dark, and disconnected” and why it does not “get it” (i.e., that digitalisation can mean either innovation or disruption – if not destruction of it); plus several top-shelf articles on solutions that already have tangibly reshaped the logistics domain. All of this stacked against a comprehensive collection of Red-hot port matters and Market SMSes, our creative way of locking news and statistics in a nutshell.

Oh, and in case you didn't know this by now, all issues of the *Harbours Review*, also the previous printed ones, are available for free on our webpage, together with other great and complementary stuff (such as the European container and ro-ro & ferry atlases). So, don't be a stranger and click www.harboursreview.com to keep a finger on the transport & logistics pulse.

Have a great read!

PRZEMYSŁAW MYSZKA



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red-hot port matters

Photo: www.all-free-download.com

Port of Hull's new STSes come online

The two £10.5m worth ship-to-shore cranes, manufactured by Liebherr in its plant in Ireland and delivered fully-built in February, have served their first ship. On 23 March, *Thea II* arrived in Hull from the Port of Amsterdam. The new 50 m-high gantries helped her to discharge and load 180 containers. "After taking around a year to construct and even longer to plan, seeing these colossal cranes up and running ahead of schedule is a highly-anticipated moment," Simon Bird, ABP Humber Director, said. He added, "These huge pieces of kit will be part of Hull's skyline for at least 20 years serving around 10,000 vessels in their lifetime." Most recently, Samskip kicked off a new sea container service between Hull and Amsterdam with three weekly sailings. After expanding the terminal, the Port of Hull, a member of the Associated British Ports (ABP), can handle up to 400k containers/year.

MLT Helsinki buys a STS from Konecranes

Multi-Link Terminals, operating a container handling facility in the Vuosaari Harbour, will receive in 2019 what's said to be the biggest widespan ship-to-shore (STS) crane ever made by Konecranes. The single-lift spreader machinery will have a rails span of 48 m, a lifting height of 31 m, and an out- and backreach of 40 m and 20 m, respectively. In addition, extra features, such as ship profiling, container positioning, and remote controlling, will be added to MLT's new STS.

Green Cargo and Yilport launch a new (ultra-short) rail service

The companies have entered into a three-year contract during which Green Cargo will operate a shuttle train between Granudden and Yilport's container terminal in the Swedish Port of Gävle. The service kicked off in mid-February and currently runs seven times per week, transporting containers loaded with export paper products. "With these shuttle trains, we're proving that it is possible to compete with road transports even on distances that are 14 km long only, given that all has been efficiently designed," Lennart Westring, responsible for sales at Green Cargo, said.

Zeebrugge port's overseas partnership

The Belgian seaport and the Québec Port Authority (QPA) have signed an agreement aimed at developing commercial ties between them. Specifically, the ports will jointly target issues related to the container traffic and finished vehicle logistics, as well as exchange best practices regarding sustainable port management and city-port relations. "This agreement with the Port of Zeebrugge marks a new era for the Port of Québec and the start of a rewarding commercial collaboration, in particular in the booming field of containers. The similarities between the Port of Québec and the Port of Zeebrugge are conducive to forging a beneficial partnership," Mario Girard, President and CEO, QPA, said. Joachim Coens, Chairman and CEO, the Zeebrugge port, added, "The port of Zeebrugge is pleased with the signing of the partnership agreement with the Port of Québec. The purpose of this agreement is to exchange expertise and experiences as well as staff and experts in different fields. Another objective is to develop goods flows between Zeebrugge and Québec in the car, container and food sectors."

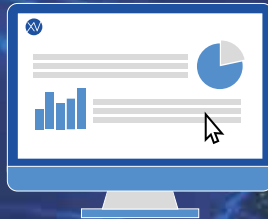
Bremerhaven to revamp the Columbus Quay

The Senate of the State of Bremen has approved the reconstruction of the cruise quay in question. Bremenports, a port authority, will now draw up a detailed plan for modernising the Columbus Quay, which was built in the years 1924-26 and is not fit to serve modern cruise vessels. Recently, the quay was used as a supplementary berth for cargo handling and shipbuilding-related operations, such as final outfitting of passenger ships. The construction phase of the €78.7m-worth project is scheduled to set off in early 2021, to be completed three years later. Last year, Bremerhaven's cruise traffic totalled 84 calls (+15 over 2016) with 166k (+68.5% year-on-year) guests on-board the vessels. This year, the port is to receive 112 calls and serve about 235k cruise passengers.

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MedPort Tangier gears up with STSes

What's said to be the world's largest ship-to-shore (STS) cranes have arrived at the MedPort Tangier, a container handling facility set to join the APM Terminals family in 2019. Each of the weighing 2.5t double trolley remote-controlled STSes is 144 m tall when boomed up. The 72 m outreach with twin-lift/tandem lift capability will make it possible to serve container ships of 22k+ TEU capacity. "These cranes use digital technology to ensure the most efficiency during their movements. This will help us to deliver increased productivity throughout the process from lifting a container box off the ship, until it is delivered to its stack in the yard, and vice-versa," Dennis Olesen, Managing Director, APM Terminals MedPort Tangier, said. Keith Svendsen, Chief Operating Officer, APM Terminals, added, "Maersk Line commissioned APM Terminals to build and operate APM Terminals MedPort Tangier so we are designing it around the customer by integrating operational excellence, the most modern cargo handling equipment and an ideal location for connecting global supply chains. This creates the necessary port capacity for the future. Equally important, this port creates another wave of future investment momentum in Morocco as a business and trade centre."



Photo: APM Terminals

P&O Ferries to move to a new berth in Tilbury

The ferry company has reached an agreement with Forth Ports to move to a purpose-built £150m river berth on the Thames at Forth's Port of Tilbury. According to a joint press release, the new facility will treble P&O's freight capacity to 600k cargo units/year by 2020. The new terminal is awaiting its planning permission. An application for a development consent order for Tilbury2 was submitted to the Planning Inspectorate in October 2017. Tilbury2 intends to build on a 152 acre site, which was part of the former Tilbury Power Station, and will include a new deep water jetty in the river Thames. "The river berth will enable us to cut our crossing time by one hour to seven hours, meaning that our customers will be discharged an hour earlier at 5am, enabling them to bypass the morning rush hour on the M25. The punctuality and reliability of the quay to quay service will be further enhanced by no longer having to negotiate a lock to exit the port," Janette Bell, Chief Executive, P&O Ferries, said. Charles Hammond, Group Chief Executive, Forth Ports, added, "As we prepare for the examination of our development consent order for Tilbury2, this new long-term partnership with P&O Ferries provides a strong economic and market underpinning of our intended development plans to grow UK trade and create further employment opportunities within Tilbury."



Photo: Port of Tilbury

Felixstowe's new STSes



Photo: Port of Felixstowe

Hutchison Port, a Hong Kong-based operator of the container terminal in the Port of Felixstowe, has taken delivery of two remote controlled ship-to-shore (STS) gantry cranes. The new machinery, the 32nd and 33rd gantry to be deployed at Felixstowe, is capable of working vessels with containers stowed 11-high and 24-wide on deck. Instead of being in a cab 50 m above the quay, the STSes' drivers will be located in a nearby operations centre. "These new cranes are the latest acquisition in our ongoing investment programme to provide the best equipment, infrastructure and systems for our customers. They will further enhance our capability to work multiple mega-vessels simultaneously," Clemence Cheng, CEO, the Port of Felixstowe, and Executive Director, Hutchison Ports, said. He added, "Remote control quay cranes have been pioneered at other Hutchison Ports terminals. Their introduction at Felixstowe will improve the working

conditions of the drivers, enhance safety and benefit communications within operational teams." Besides the new equipment, the port is creating an additional 18k TEU of container storage capacity, upgrading its terminal operating system, raising the height of 10 STS cranes on the Trinity Terminal, and it has eight additional yard cranes on order for delivery in early 2019.

HHLA takes over Muuga CT

Hamburger Hafen und Logistik (HHLA) has acquired the Estonian terminal operator Transiidikeskuse together with control over the Muuga Container Terminal. The 600k TEU of annual handling capacity facility in Muuga offers four 12.5-14.5m-deep quays with a total length of 1,094 m. There are 404 reefer plugs on the site. The 38 ha-big terminal is equipped with three ship-to-shore cranes, one rail-mounted and six rubber-tyred gantries, nine reachstackers, and 11 shuttle carriers. Apart from containerised freight, also wheeled cargo (ro-ro), break-bulk, and dry bulk goods are handled at the terminal.



Photo: Transiidikeskuse

Piraeus III arrives

COSCO's ship Xin Guang Hua has delivered the *Piraeus III* floating dock to the Port of Piraeus' Ship Repair Zone of Perama. The dock has a lifting capacity of 22kt which will make it possible to serve Panamax ships up to 240 m in length and 80 m in width. *Piraeus III* is to become operational once associated works are completed, including dredging, installation of mooring buoys, and setting up the electromechanical infrastructure.

Newport to have a new warehouse

Work is underway on a £4.5m project to provide additional warehousing at Associated British Ports' (ABP) Newport to accommodate growth seen in agriculture-related cargo volumes. Once commissioned at North Side, South Dock, the 21 Shed will provide 70k sq ft of covered storage facilities. Last year, the Welsh Port of Newport handled 14% more bulk fertilizer imports than in 2016 as well as 54% year-on-year more animal feed imports. ABP recently invested in Newport's agribulk capacities, including £3.3m in new cranes in 2015, and £2.3m in a 3.5k sq ft warehouse and weighbridge facilities a year later. "Agribulk cargo volumes have been increasing steadily at Newport for several years. In order to support this, we have been proactive in our approach to investments for port customers to ensure that their businesses as well as the local farmers, feed mills, and other industries they support, can continue to benefit from ABP's services for many years to come," Ralph Windeatt, Port Manager for Newport, said.

Gothenburg has two new terminals



First, the operations of the Arken Combi Terminal (ACT) have been officially inaugurated at the Port of Gothenburg, where the new facility rests next to the container and ro-ro terminals. The 65k m²-big terminal is expected to handle over 100k trailers a year. Already today, the ACT is taking care of seven trains per day, i.e., two more than its predecessor – the now-

closed terminal at Gullbergsvass. Part of the old terminal will be converted into urban areas, whereas the Swedish Transport Administration, with the help of the Gothenburg port, will set up the West Rail 8.0 km-long double-track rail link on the remaining premises. Second, after eight months of work, at a cost of SEK14m (approx. €1.36m), the Port of Gothenburg has opened the refurbished America Cruise Terminal at the Stigbergskajen in Masthugget. The terminal is able to receive ships up to 225 m in length and 45 m in width. As such, out of the 43 cruise calls scheduled for this year, 23 will take place at the new facility (other vessels will continue to berth in the outer port area). The 193 m-long AIDA cara was the first ship to call in the new America Cruise Terminal on 13 April. The Port of Gothenburg says that it will serve around 60k guest in total this year. According to estimations, these passengers will purchase goods and services in the city worth some SEK30m (approx. €2.92m).



Photos: Port of Gothenburg

DCT orders Kalmar's RTGs

The Deepwater Container Terminal Gdańsk has purchased five fully electric rubber-tyred gantry cranes (RTGs) from the Finnish Kalmar. Each of the cable-reel Zero Emission RTGs, scheduled for delivery in early 2019, will be able to lift up to 45t. The machines will have a number of additional features, including a machine-vision-based anti-sway system with an extended camera system to assist the operator, Kalmar SmartRail automated gantry steering solution, Kalmar SmartFleet process automation solution, and Kalmar SmartProfile spreader anti-collision system. The deal also includes the supply of spare parts. Once deployed, DCT's RTG fleet will grow to 40 cranes, of which seven will be Kalmar machines.

Antwerp to extend its LNG bunkering services

Fluxys, a Brussels-based supplier of gas, has taken over the concession to operate at the quay 526-528 in the Port of Antwerp. The company, which already offers truck-to-ship bunkering in the Antwerp port, will install at the quay a permanent liquefied natural gas (LNG) bunkering infrastructure to be used to gas-fill barges and smaller seagoing vessels. The facility will be ready by end-2019 and will also feature an LNG truck filling station, set up in collaboration with G&V Energy Group. Meanwhile, Antwerp is working together with the ports of Amsterdam, Rotterdam, Zeebrugge, Bremen, Le Havre, and Marseille on the LNG Accreditation Audit Tool, the aim of which is to make the accreditation process for providing LNG bunkering more standardised.

Viking Grace to sail on wind

Viking Line's LNG-run cruise ferry is the world's first passenger ship to be equipped with a rotor sail thanks to which she'll be able to use wind as an auxiliary source of power for propulsion. The sail, developed by the Finnish Norsepower, is 24 m high and has 4.0 m in diameter. The machinery takes advantage of the so-called Magnus effect – as the rotor is spinning, the passing air flows with a lower pressure on one side than on the opposite; the propulsion force created by this pressure difference drives the vessel forward. The operations of the rotor sail are automated – the system will shut down in response to disadvantageous changes in the wind's direction or force. According to Viking Line and Norsepower, using the rotor sail means emitting as much as 900t of CO₂ less per year. The ferry line's newbuild, currently under construction in China and scheduled to set sail in 2020, will have two rotors mounted on her. "This is a great day for us. As an Åland shipping company, we rely on the sea for our livelihood so it's of prime importance for us to promote the well-being of the marine sea. We want to pioneer the use of solutions that reduce the environmental load. Based in Finland, Norsepower has developed a world-class mechanical rotor sail solution that will reduce fuel consumption. We are proud of the fact that our Viking Grace will be the first passenger ship in the world to benefit from this innovative solution," Jan Hanses, CEO, Viking Line, said. Tuomas Riski, CEO, Norsepower, added, "For Norsepower, it's an honour to be able to make the M/S *Viking Grace* even more environmentally-friendly by means of our novel rotor sail technology. The last traditional windjammers in the world were owned and operated by shipping companies based in Åland, so it's fitting that Åland-based Viking Line should be a forerunner in launching modern auxiliary sail technology. Viking Line and Norsepower's organisations have collaborated in an excellent manner in retrofitting the rotor sail solution on the *Viking Grace*, and the completion of this project is a great moment for all those involved."

North-West European CO₂ coalition

The Port of Rotterdam is calling on the Dutch government to form a coalition with countries in NW Europe to set a joint CO₂ price in order to encourage greener transport & logistics. "A price in the range of €50-70 per ton of CO₂ will stimulate companies to invest in solutions that we really need in order to realise the targets of the Paris Climate Agreement," Allard Castelein, CEO, the Port of Rotterdam Authority (PRA), said. He added, "As a transit country, the Netherlands is closely linked to the countries that surround it. A North-West European coalition would guarantee a level playing field for the industry (...). The Government is currently focusing on the reduction of greenhouse gases. In order to switch to a new energy system, as a Government you also need an integral vision and a corresponding industrial policy for the new economy, the future industrial landscape and the type of R&D required to achieve that. I also think that this is an important task for the Government. So: international pricing, national stimulation." The Rotterdam/Moerdijk port industrial area faces the challenge of reducing CO₂ by 20mt/year as of 2030 (-49% compared to 1990). According to a study commissioned by the PRA and produced by the Wuppertal Institute, marine and inland transport with Rotterdam as the destination or departure point is responsible for emissions of around 25mt of CO₂/year (out of which 21.5mt is attributable to the marine sector). To ensure that this sector also complies with the Paris Climate Agreement, emissions will have to be reduced by 95% by 2050. The first half of this target (up to 50%) can be achieved by efficiency measures, but the remainder will require the deployment of different fuels. As its own initiative, the Rotterdam port will launch a €5.0m scheme to promote climate-friendly maritime shipping, e.g., supporting vessel owners and charterers that experiment with low/zero-carbon fuels. In addition, the port will also offer 100% discount on inland port charges for vessel owners that comply with the platinum certificate of Green Award, a Rotterdam-based foundation promoting eco-friendly shipping (the certificate in question is granted to those sailing on electricity or fuel cells for at least 50% of the time or for three hours a day). The discount will also apply to the users of the NextLogic platform, a planning tool developed to optimise handling of inland container shipping that takes place in the port.



Photo: Port of Rotterdam

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3i Group sells Scandlines, but re-buys stake

The ferry operator has been sold for €1.7b to the infrastructure funds First State Investment (FSI) and Hermes Investment Management (HIM). At the same time, the 3i Group has decided to reinvest, in conjunction with FSI, in Scandlines by acquiring 35% of its shares. As a result, FSI holds a 50.1% stake, while HIM 14.9%. The 3i Group has also disclosed that it made net cash profit of €347m from selling Scandlines. Initially, the 3i Group, together with funds they're managing, acquired a 40% stake in Scandlines back in 2007. They increased their share up to 50% in 2010 and took full ownership at the end of 2013. Meanwhile, FSI bought from Scandlines and Stena Line the Helsingborg-Helsingør service, which since that time has been trading under the Scandlines H-H brand (in a co-op with Scandlines). Currently, Scandlines operates across two ro-pax routes in the south of the Baltic Sea: Gedser-Rostock and Rødby-Puttgarden. The company also owns Danish harbours in Gedser and Rødby.

MSC exchanges one feeder service for two ocean

The shipping company has altered its Baltic network and will now directly call to Gdynia and Klaipėda with two worldwide deep sea services. The East Africa and Indian Ocean Express will link the Polish and Lithuanian seaports with Antwerp, Le Havre, Fos-Sur-Mer, King Abdullah Port, Pointe Des Galets, Port Louis, Mombasa, Sines, and Bremerhaven. The Australian Express, in turn, will have Gdynia and Klaipėda included in a loop together with Bremerhaven, Antwerp, Le Havre, La Spezia, Naples, Gioia Tauro, King Abdullah Port, Sydney, Melbourne, Adelaide, Fremantle, Singapore, Colombo, Salalah, Djibouti, Valencia, London Gateway, and Rotterdam. The first service was inaugurated in the Baltic on 25 April with the arrival of the 334.07 m-long and 42.87 m-wide 8,204 TEU of capacity *MSC Paris* in Gdynia at the Baltic Container Terminal Gdynia. The latter was kicked off in Gdynia five days later by the 274.67 m-long and 40 m-wide 5,926 TEU *MSC Carolina*.



Photo: Port of Gdynia/Tadeusz Urbaniak

Zamakona Yards to build two ships for RAL

The Nuuk-based Royal Arctic Line has entrusted the Bilbao-located shipyard with the construction of two container ships. The vessels are set for delivery by 2020. The two will replace *Pajuttat* and the chartered *Vestlandia* in serving northwest Greenland. The concept design of the newbuildings will be provided by the Norwegian Havyard.

Port of Thessaloniki sold

On December 21, 67% of shares in the Greek port were sold for nearly €232m to SEG T consortium consisting of Deutsche Invest Equity Partners, Belterra Investments, and Terminal Link SAS. The agreement is waiting to be ratified by the parliament; the purchase is expected to be concluded in Q1 2018. However, it does not include port infrastructure, which has been leased to the Thessaloniki Port Authority via a concession until 2051. The total value of the agreement amounts to €1.1b and, apart from the shares acquisition, includes mandatory investments amounting to €180m within the next seven years, as well as expected revenues from the Concession Agreement for the Hellenic Republic, estimated at over €170m. The total value also includes the expected dividends receivable by the Hellenic Republic Asset Development Fund for the remaining 7.22% of shares and the estimated investments (in excess of the mandatory ones) until the end of the 2051 concession period.

Vistula Maersk arrives in the North

The brand-new feeder, offering 3,596 TEU of carrying capacity (incl. 600 reefers), made its maiden calls to the Port of St. Petersburg's Petrolport (PLP) and First Container Terminal (FCT) on 20 April. The 1A ice class vessel, 200 m-long and 35.2 m-wide, will be shortly joined by her sister ship *Volga Maersk*. The two will serve Seago Line's L16/L01 service that connects Rotterdam's APM Terminals 1, Delta Container Terminal, and APM Terminals Maasvlakte 2 with St. Petersburg's PLP and FCT. Five other feeders of the same class will be deployed during the coming months across a number of Seago Line's services in the Baltic and North Seas. They will replace smaller ships in the 1,400-1,700 TEU range.



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THE PORT OF THESSALONIKI:

15.58mt handled in 2017 (+10.5% yoy)

General cargo marked the biggest uptick last year, going up by 15.9% over 2016 and totalling 4.68mt.

The Port of Thessaloniki's volumes

	2017	Yoy
Liquids		
Oil products	4,078.2kt	+8.75%
Crude oil	3,350.1kt	+10.8%
Gaseous/liquefied/compressed petroleum products & natural gas	258.8kt	-11.85%
Chemicals	22.9kt	+110%
Total	7,710.0kt	+8.9%
General cargo		
Containerised	4,061.1kt	+17.4%
Other	528.4kt	+1.7%
Wheeled (ro-ro)	93.7kt	+49.4%
Total	4,683.1kt	+15.9%
Dry bulk		
Ores, cement, lime & plasters	2,159.0kt	+10.7%
Coal & lignite	321.0kt	-2.2%
Foodstuff, fodder & oil seeds	212.4kt	+40.6%
Chemicals	150.1kt	-15.5%
Other	126.7kt	+18.4%
Grains	121.6kt	-45.3%
Total	3,189.5kt	+7.0%
GRAND TOTAL	15,580.1kt	+10.5%
Container traffic		
No. of containers	273,550	+18.7%
TEU	401,473	+16.6%
Passenger traffic		
Ferry	47,939	-5.3%
Cruise	2,424	-86.7%
Total	50,363	-26.8%

FINNLINES:

709k ro-ro cargo units carried in 2017 (+12.7% yoy)

On the other hand, the company transported less non-utilised freight last year – down by 20.5% year-on-year to 1,281kt. However, Finnlines' fleet carried more commercial vehicles in 2017 – up by 23.5% yoy to 147k. Also, more passengers (incl. truck drivers) boarded the company's ships – by 2.8% over 2016.

THE PORT OF KOPER:

23.37mt handled in 2017 (+6.2% yoy)

The turnover of containerised goods rose the most in 2017 – by 9.6% year-on-year to a total of 9.07mt.

The Port of Koper's volumes

	2017	Yoy
Containerised	9,071.4kt	+9.6%
Dry bulk	7,917.5kt	+6.0%
Liquids	3,876.5kt	+7.9%
Other general cargo	1,377.7kt	-10.1%
Vehicles	1,123.8kt	-1.4%
Total	23,367.0kt	+6.2%
Container traffic		
TEU	911,528	+7.9%
Finished vehicle logistics		
Cars	741,253	-1.0%
Pax traffic		
Passengers	72,175	-8.6%

DFDS SEAWAYS:

37,782k lane metres filled in 2017 (+/-0% yoy)

At the same time, the company's ferries served nearly 5.35m passengers, up by 0.4% on the 2016 result.

DFDS' volumes

Area	2017	Yoy
Sea shipping division		
English Channel	19,073k lm 3,465k passengers	-6.2% +0.1%
North Sea	12,611k lm	+7.1%
Baltic Sea	4,559k lm 205k passengers	+12.6% -1.9%
France & the Mediterranean	950k lm 39k passengers	-5.3% -4.0%
Passenger (Copenhagen-Oslo & Amsterdam-Newcastle)	589k lm 1,341k passengers	-7.1% +2.6%
Total	37,782k lm 5,349k passengers	+/-0% +0.4%
Logistics division		
Continent	228.7k cargo units	+2.6%
UK & Ireland	184.6k cargo units	+2.7%
Nordic	135.2k cargo units 400.4kt	+13.2% -6.3%
Total	548.5k cargo units 400.4kt	+5.0% -6.3%

TALLINK:

90,687 ro-ro cargo units carried in Q1 2018
(+8.2% yoy)

However, fewer passengers boarded the company's ferries in the reported period – down by 0.5% year-on-year to slightly over 1.93m.

Tallink's volumes

	Q1 2018	Yoy
Ro-ro cargo units		
Estonia-Finland	58,379	+12.9%
Finland-Sweden	16,145	-15.6%
Estonia-Sweden	12,258	+15.9%
Latvia-Sweden	3,908	+62.6%
Total	90,687	+8.2%
Passengers		
Estonia-Finland	1,025,036	+1.3%
Finland-Sweden	522,945	-9.9%
Estonia-Sweden	227,279	+5.7%
Latvia-Sweden	155,189	+16.8%
Total	1,930,449	-0.5%
Pax cars		
Estonia-Finland	174,110	+3.1%
Finland-Sweden	18,219	-16.3%
Latvia-Sweden	15,545	+20.9%
Estonia-Sweden	14,496	+4.2%
Total	222,370	+2.3%

THE PORT OF GENOA:

2,622,187 TEU handled in 2017 (+14.1% yoy)

Measured in tonnes, the Italian port's containerised freight traffic rose by 15.4% year-on-year to over 25.83mt in 2017. In total, the Port of Genoa handled 55.16mt last year, more by 8.6% yoy on the 2016 result. General cargo advanced by 12.5% yoy to 35.54mt (including, apart from containers, 9.72mt of wheeled and break-bulk, which rose by 5.5% yoy to 9.72mt). Liquids came in second with 15.23mt (+4.5% yoy), followed by 3.41mt of dry bulk (-6.6% yoy), and 0.98mt of bunkers and supplies (+1.3% yoy). Genoa's passenger traffic decreased last year – by 3.4% yoy to just over 3.0m travellers. Ferry traffic lost 0.7% yoy down to 2.08m, while the cruise segment marked a downtick by 9.1% yoy to 925.2k travellers. Genoa is part of the Western Ligurian Sea Port Authority, also comprising the harbours in Vado Ligure, Savona, and Pra'.

THE PORTS OF STOCKHOLM:

59,901 TEU handled in 2017 (+11% yoy)

Apart from the new container handling record, the three Swedish ports within the Ports of Stockholm authority also recorded a new all-time high in cargo turnover, making 9.7mt in 2017 (+7.8% year-on-year). Out of the total, ro-ro & ferry traffic accounted for 6.9mt (+4.5% yoy). In addition, the ports noted a new record in passenger traffic, which rose by 2.6% yoy last year to 12m ferry & cruise travellers.

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THE PORT OF BILBAO:

34.2mt handled in 2017 (+7.2% yoy)

The Spanish port's container traffic rose in 2017 as well – by 1.4% year-on-year to a total of 604,870 TEUs. On the other hand, Bilbao's passenger traffic noted a downtick last year – by 2% yoy to 186,546 passengers, of which 102,872 came on-board ferries while the remaining 83,674 were brought by cruise ships.

RAIL CONTAINER TRAFFIC IN RUSSIA:

1.0m TEU carried in Q1 2018 (+12.6% yoy)

Domestic shipments totalled 430k TEU (+3.5% year-on-year), followed by 274.8k TEU made in export (+16.7% yoy), 198.3k TEU in import (+21.6% yoy), and 100.6k TEU in transit traffic (+30.1% yoy). Out of the total number, laden containers amounted to 663.9k TEU/9.4mt, 14.8% and 12.4% yoy, respectively, over Q1 2016. The laden traffic included 114k TEU loaded with chemicals & soda (+7.3% yoy), 81.1k TEU with timber (+43.2% yoy), 75.6k TEU with paper (+8% yoy), 59.3k TEU with industrial goods (+15.3% yoy), 58.8k TEU with fabricated metal products (+22.6% yoy), 51k TEU with cars (+33.5% yoy), 46k TEU with machines, machine tools, and engines (+26.7% yoy), 27.3k TEU with non-ferrous metals (+7.5% yoy), 27.4k TEU with ferrous metals (+23.8% yoy), 19k TEU with miscellaneous goods (+1.5% yoy), 17.7k TEU with construction materials (+6.8% yoy), and 14.7k TEU with chemical & mineral fertilizers (-13.1% yoy). Overall, Q1 2018 rail freight traffic in Russia amounted to 315.7mt (+3.5% yoy). Transport performance rose as well – up by 4.6% yoy to 636.2bt-km (excl. empty wagon runs).

THE PORT OF DUBLIN:

36.42mt handled in 2017 (+4.3% yoy)

With 30.08mt (+4.4% year-on-year) handled last year, unitised freight continues to dominate Dublin's port traffic.

The Port of Dublin's volumes

	2017	Yoy
Wheeled (ro-ro)	23,412kt	+4.1%
Containerised	6,673kt	+5.4%
Liquids	4,281kt	+6.6%
Dry bulk	2,034kt	-1.0%
Beak-bulk	22.0kt	-52.8%
Total	36,422kt	+4.3%
Detailed unitised freight traffic		
Ro-ro cargo units	992,062	+5.0%
TEU	698,348	+5.2%
Finished vehicle logistics (commercial vehicles, new cars)	99,383	-4.6%
Pax traffic		
Total, of which	1,990,561	+3.6%
Ferry	1,846,553	+1.8%
Cruise	144,008	+34.3%
Pax cars	514,908	+1.9%

THE PORT OF TRIESTE:

61.95mt handled in 2017 (+4.6% yoy)

General cargo rose the most last year – by 14.1% year-on-year to a total of 16.56mt. At the same time, the Italian port handled 43.75mt of liquids (+2.3% yoy) and 1.64mt of dry bulk (-16.8% yoy). Trieste's 2017 container traffic increased by 26.7% on the 2016 result, amounting to 616,156 TEU (incl. 547,582 laden twenty-foot boxes, more by 25.3% yoy).

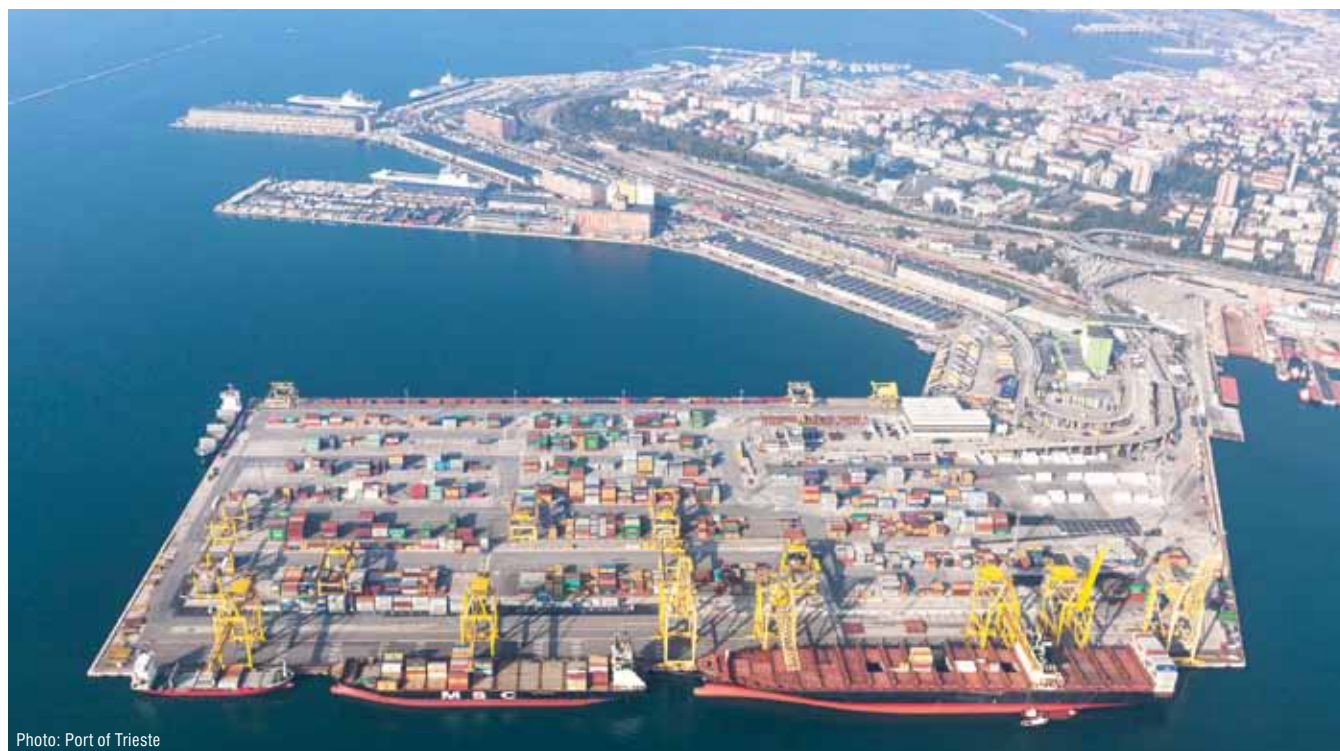


Photo: Port of Trieste

THE PORT OF CONSTANTZA:

58.38mt handled in 2017 (-1.8% yoy)

The handlings of dry bulk, the main commodity traded in the Romanian port, went down last year by 1% year-on-year, totalling 34.85mt.

The Port of Constantza's volumes

	2017	Yoy
Dry bulk	34,854.0kt	-1.0%
Liquids	13,354.3kt	-2.3%
Containerised	6,524.1kt	-5.4%
Other general cargo	3,646.8kt	-0.8%
Total	58,379.1kt	-1.8%
Container traffic		
No. of containers	413,253	-4.9%
TEU	696,438	-2.1%

THE PORT OF HIRTSHALS:

142k ro-ro cargo units handled in 2017 (+1.9% yoy)

In total, the Danish port's 2017 freight traffic amounted to 1.9mt, more by 6% over the result from 2016.

HAPAG-LLOYD:

9.8m TEU carried in 2017 (+28.9% yoy)

The increase is chiefly a result of a merger with the United Arab Shipping Company (UASC), which was completed in May 2017. "The successful merger with UASC has significantly strengthened our competitive position. We also benefitted from improved freight rates and a positive development of the worldwide container transport volume," Rolf Habben Jansen, Chief Executive Officer, Hapag-Lloyd, said. He added, "The market environment remains challenging, but as we see some of the fundamentals improving gradually over the upcoming period, we remain cautiously optimistic. Going forward, our customers will benefit from further improved services and new digital products."

KOMBIVERKEHR:

78,991 trucks consignments shipped between inland Germany and Kiel-Lübeck-Rostock in 2017 (+3.3% yoy)

In total, however, the German company rail carried less containers, swap bodies, and trailers in 2017 – down by 2.8% year-on-year to 958,299 truck consignments (equivalent of 1.9m TEU). International traffic, excluding the Baltic Sea, noted a drop by 4.9% yoy to 671,719 trucks consignments dispatched on railways. On the other hand, the company carried more cargo units within Germany across the de.NETdirekt+ network, noting here an increase by 2.3% over 2016, up to 207,589 truck consignments overall. According to Kombiverkehr, by preferring rail over road services, the company's clients relieved the environment of 1.1mt of CO₂ last year, more or less the same volume as in 2016.

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Uniformity with financial and environmental balance

by Ewa Kochańska

According to the latest *Annual Report* prepared by the European Sea Ports Organisation (ESPO) for the year 2016-2017, the big issues for Europe's port industry included fiscal regulation, where ESPO believes more financial independence and better investment in port infrastructure are needed; the practical ramifications of Brexit, especially in the area of trade (although 2017 saw little change there); and the on-going issue of environmental protection and the effects of the port industry on surrounding ecosystems.

The matters of increasing bureaucracy and the need for conformity in transportation procedures among all EU Member States as well as determining where that uniformity is useful or even possible are also highlighted in the paper. Furthermore, ESPO calls for a "global and urgent response to the problem of CO₂ emissions in the shipping sector," at the same time emphasizing that ports cannot be held responsible, financially and otherwise, for the shortcomings of the shipping sector in the area of environmental responsibility.

Port governance

Several regulatory changes took place in 2017 that affect the ports of the European Union. A new EU regulation, establishing rules for financial transparency of ports, will go into effect on 24 March 2019. ESPO supports some measures in the new law, such as flexibility in the organization of port services and more transparency in how public funds are allocated. Additionally, the regulation limits bureaucracy when dealing with complaints and didn't

increase the scope of the Directive in the matters of concession contracts, all of which ESPO supports.

However, the Organisation is against the lack of opportunity for ports to establish their own financial strategy. The EU would like to see less reliance from ports on public funding yet it won't allow port authorities to take charge of their own financial situation. ESPO plans to continue the conversation with the European Commission (EC) about the new regulation ahead of the March 2019 implementation date.

Another law concerning ports, adopted by the EU on 17 March 2017, extended the scope of the General Block Exemption Regulation (GBER) to cover the port industry. This regulation aims to eliminate unnecessary bureaucracy in cases of "non-problematic state aid" for port infrastructure by exempting ports from notification to the EC. Also of significance for European ports, on 27 July 2017, the EC officially required Belgium and France to end corporate tax exemptions for their sea and inland ports in compliance with the EU state aid rules.

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ESPO's sustainability report 2017

This report provides a snapshot concerning the progress made by European seaports in the field of environmental performance. Data from a total of 91 ports from 21 countries were submitted using the EcoPorts self-diagnosis method (SDM), a checklist used for analysing environmental risks and determining environmental priorities for policy implementation and regulation compliance. The inputs were then categorised according to four indicators: environmental management, environmental monitoring, top environmental priorities, and services to shipping.

Table 1 provides a ranking of the 10 PORTOPIA indicators which provide information about environmental policies and concerns for port authorities in Europe.

definition of objectives and targets for environmental improvement. Also notable are biggest changes since 2013, and that's in existence of an Environmental Management System (EMS) which grew by 16 percentage points (pp) and the documentation of environmental responsibilities of key personnel which grew by 15pp. The existence of an environmental monitoring program is another factor that's consistently growing, with a 10pp change in the last four years and 7pp since 2016.

The index for measuring environmental management (EMI) was developed on the basis of these 10 factors, and is considered to be especially effective in measuring the potential and the ability to deliver the needed environmental mandates. Consequently, the EMI for

Finally, the EC has pushed for more eco-friendly technologies, including environmental port charging. A study published by the Commission on 27 June 2017 suggests that a voluntary character of incorporating environmentally-conscious technologies has not been effective. ESPO has always supported more ecologically mindful practices in ports, but it believes that final decisions on this subject should be industry-driven without EU's direct regulation.

Intermodal, logistics, and industry

Last year, ESPO has continued following the implementation of the 2013 legislative framework on the Trans-European Transport Network (TEN-T) and its funding instrument – the Connecting Europe Facility (CEF). On 8 February 2017, the European Commission released €1.0b in funds for transportation projects in the EU under the year's first CEF Transport Blending MAP Call for Proposals. The goal was to maximize private involvement in the distribution of CEF funds and the call had two due dates: mid-July 2017 and 12 April 2018. Once all the funds are allocated, about 95% of the entire 2014-2020 CEF transport budget will be used.

In preparations for the post-2020 EU budget, ESPO re-launched its "More EU Money for Transport, The Best Investment plan for Europe" campaign, with the support of 30 transport organizations. In order to get ready for CEF II, the EC has been evaluating the current Facility. To be more effective, in December 2016 the

Tab. 1. Environmental management indicators

Indicators	2013	2016	2017	2017-2013 [pp]
Existence of an Environmental Management System (EMS)	54 %	70%	70%	+16
Existence of an Environmental Policy	90%	92%	97%	+7
Environmental Policy makes reference to ESPO's guideline documents	38%	34%	35%	-3
Existence of inventory of relevant environmental legislation	90%	90%	93%	+3
Existence of an inventory of Significant Environmental Aspects	84%	89%	93%	+9
Definition of objectives and targets for environmental improvement	84%	89%	93%	+9
Existence of an environmental training programme for port employees	66%	55%	68%	+2
Existence of an environmental monitoring programme	79%	82%	89%	+10
Environmental responsibilities of key personnel and documented	71%	85%	86%	+15
Publication of publicly available environmental report	62%	66%	68%	+6

Source for all tables and figures: ESPO's sustainability report 2017

One of the most encouraging indicators is that almost all the participating countries have an environmental policy. Next best indicators, at 93% each for year 2017, are in inventory of relevant environmental legislation, inventory of Significant Environmental Aspects (SEA), and

the ports sector in 2013 was 7.25, in 2016 – 7.72, and in 2017 – 8.08.

Also of significance is that at least 64 out of the 91 European ports are EMS-certified to an internationally recognised standard (Fig. 1). This illustrates a positive trend in ports being interested in seeking

ESPO believes that IMO needs to specify the CO₂ targets to decrease shipping emissions, submit short-term and long-term reduction goals to the stocktake process of the Paris Agreement in 2018, and by 2023 come up with some clear-cut measures and targets to reduce CO₂ emissions.

Commission launched a public consultation in which ESPO participated. In addition to giving some suggestions for a better selection process, ESPO's main points included the need for more budget, the importance of foreseeing a grants component, the need for a better definition and implementation of the "EU added value," and the necessity for a long-term vision.

To further assist the Commission in preparation for CEF II, ESPO commissioned a study on infrastructure priorities as well as financing solutions in European ports post-2020. ESPO hopes the study will illustrate the diversity of needs among the ports in Europe and how effective and sustainable an investment in these ports can be. Additionally, the study will help counter-argue some of the conclusions reached in the 2016 special report authored by the European Court of Auditors (ECA) and which bears a meaningful title *Maritime transport in the EU: in troubled waters – much ineffective and unsustainable investment*. While ESPO supports the auditing process, this audit covered only 19 ports in

five EU Member States and that raises concerns that the report has actually reviewed Regional and Cohesion funds.

Additionally, in spring of 2016, the Commission delegated a study on best TEN-T maritime transport implementation methods. ESPO is monitoring the developments of the study, which received a deadline extension to mid-2018. The study is set to prioritize the "untapped potential" of the ports in the TEN-T network.

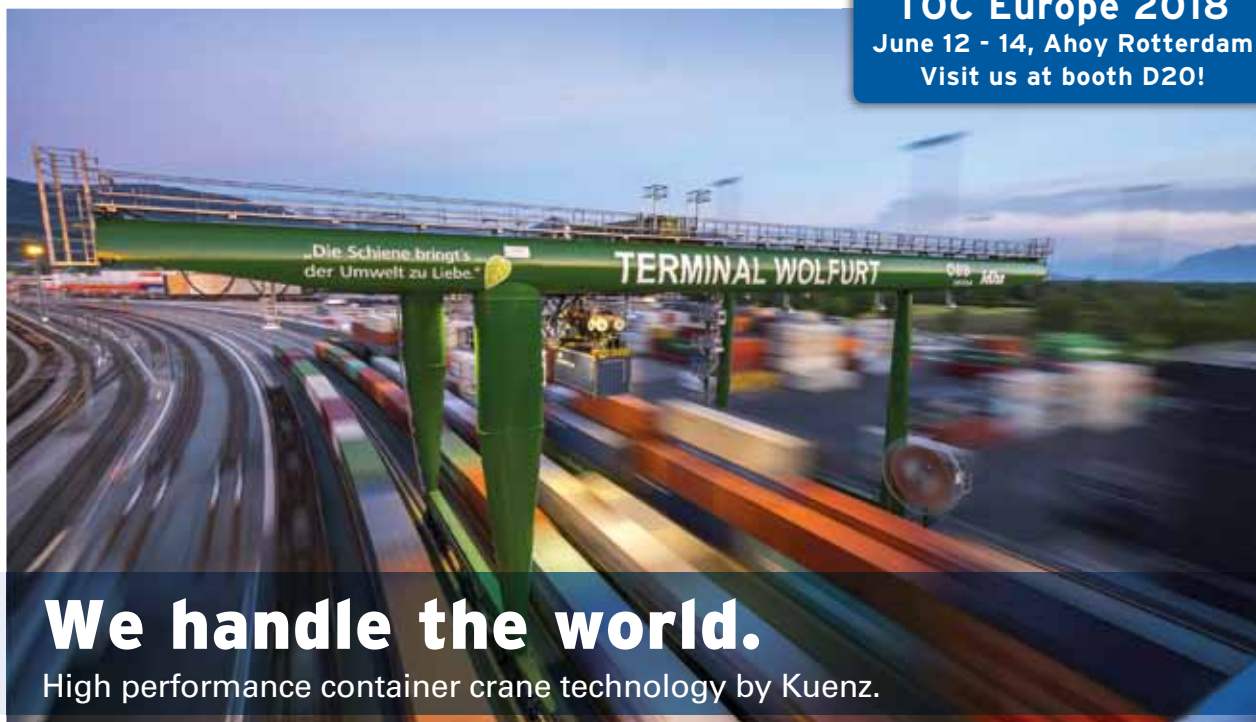
Also related to infrastructure needs, on 13 September 2017 the Commission published a proposal to create a framework for monitoring foreign direct investments (FDI) coming into the European Union. The Commission's concerns are for "public order and security" as well as protection of Europe's interests. Because FDIs play an important role in European ports, ESPO is attentively following the proposal's developments.

Trade facilitation, customs, and security

The Organisation's Trade Facilitation Committee has once again taken up the

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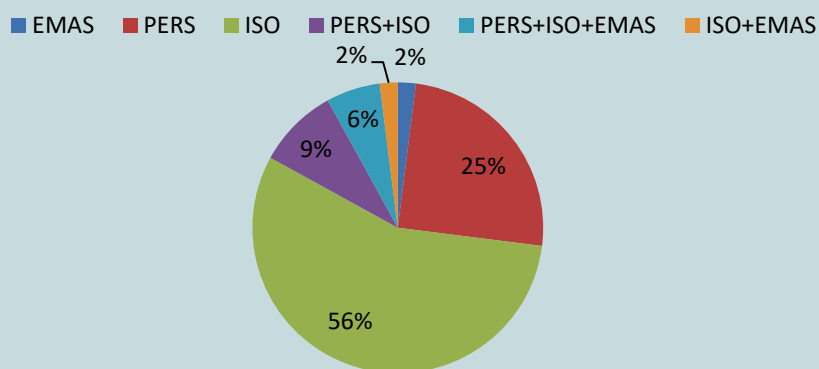
Reporting Formalities Directive (RFD), which had been under a so-called REFIT (the European Commission's Regulatory Fitness and Performance programme) evaluation since 2016. The RFD is a Directive that reports formalities related to the arrival and departure of ships at EU's ports. Its initial goal was to ease the burden of administrative procedures with the "single window environment" across all EU Member States.

ESPO, along with other stakeholders and the Commission, has concerns that the RFD is not efficient and perhaps making things more difficult. In the Roadmap for Maritime Trade Facilitation, ESPO underscored that electronic reporting must be done through a uniform system; the ships arriving at ports should report "the same data elements" in each port and using the same format, with additional information required only in special circumstances. The stakeholders along with ESPO were able to contribute to the "inception impact assessment" of the RFD, launched by the Commission in August 2017, where ESPO laid out the conditions needed for a successful implementation of a single window environment in Europe's ports. ESPO is also continuing to contribute to the eManifest pilot project which is supposed to demonstrate in real life how reporting to a single window can help harmonise and consolidate the processing of cargo data for maritime and customs purposes.

Likewise, ESPO has been active in the Digital Transport and Logistics Forum (DTLF). The DTLF, set up by the Commission in June 2015, is a group of experts who bring together stakeholders from public and private sector within the transport and logistics industries to create a common vision on transport digitisation. The forum identifies transport challenges and provides the Commission with recommendations and implementation ideas. Additionally, the Trade Facilitation Committee has continued to monitor the implementation of the amended International Convention for the Safety of Life at Sea (SOLAS) – the SOLAS Container Weight Verification Regulation, which requires shippers to report the full weight of laden containers prior to loading them.

Lastly, a major issue for EU ports, which rely so strongly on trade, has been Brexit (read more on pgs. 74-75). After the leave vote in Britain in June of 2016, ESPO created a Brexit-specific working group

Fig. 1. EMS certificates held by European ports



Tab. 2. Environmental monitoring

Indicators	2013	2016	2017	2017/2016 [pp]
Waste	67%	79%	88%	+21
Energy consumption	65%	73%	80%	+15
Water quality	56%	70%	75%	+19
Water consumption	58%	62%	71%	+13
Air quality	52%	56%	69%	+17
Sediment quality	56%	63%	65%	+9
Noise	52%	57%	64%	+12
Carbon footprint	48%	47%	49%	+1
Soil quality	42%	44%	48%	+6
Marine ecosystems	35%	36%	44%	+9
Terrestrial habitats	38%	30%	37%	-1

environmental credentials and being open and transparent about their environmental policies.

Environmental monitoring is a category of indicators that measures to what extent do European ports monitor important environmental factors (Tab. 2).

As table 2 illustrates, some factors have seen an immense improvement, such as waste management with improvement of 21pp, water quality with 19pp, air quality with 17pp, and energy consumption with 15pp. The rapid progress

Tab. 3. Top 10 environmental priorities for the European port sector in 1996-2017

No.	1996	2004	2009	2013	2016	2017
1	Port development: water	Garbage/port waste	Noise	Air quality	Air quality	Air quality
2	Water quality	Dredging: operations	Air quality	Garbage/port waste	Energy consumption	Energy consumption
3	Dredging: disposal	Dredging: disposal	Garbage/port waste	Energy consumption	Noise	Noise
4	Dredging: operations	Dust	Dredging: operations	Noise	Relationship with local community	Water quality
5	Dust	Noise	Dredging: disposal	Ship waste	Garbage/port waste	Dredging: operations
6	Port development: land	Air quality	Relationship with local community	Relationship with local community	Ship waste	Garbage/port waste
7	Contaminated land	Hazardous goods	Energy consumption	Dredging: operations	Port development: land	Port development: land
8	Habitat loss/degradation	Bunkering	Dust	Dust	Water quality	Relationship with local community
9	Traffic volume	Port development: land	Port development: water	Port development: land	Dust	Ship waste
10	Industrial effluent	Ship discharge (bilge)	Port development: land	Water quality	Dredging: operations	Climate change



within the Trade Facilitation Committee. The debate between Brussels and London pertaining to trade is a hot-button issue for most global trading partners, with Britain seeking a free trade agreement in as many economic sectors as possible and the EU thus far unwilling to show its cards. The uncertainty of these trade deals threatens financial stability in both the EU and the UK.

Sustainable development

In 2017, ESPO celebrated the 20th anniversary of the EcoPorts network. This first European environmental

initiative in the port sector grew from just seven ports in 1997 to around 100 members from 22 countries by 2017. Recently, two especially important changes were made in the EcoPorts network. First, the Self Diagnosis Method (SDM) was upgraded to more effectively deal with climate change. Second, the Port Environmental Review System (PERS) got an update with changes made to ISO 1400:2015.

Also last year, ESPO called for the EU to put more pressure on the International Maritime Organization (IMO) to take action concerning the fulfilment of the Paris Agreement on climate change, which requires countries to make immediate

policy adjustments ensuring that the global temperature does not increase above 2°C (the rise should fall below 1.5°C if at all possible). ESPO believes that IMO needs to specify the CO₂ targets to decrease shipping emissions, submit short-term and long-term reduction goals to the stocktake process of the Paris Agreement in 2018, and by 2023 come up with some clear-cut measures and targets to reduce CO₂ emissions. Due to environmental concerns, the European Parliament included CO₂ emissions from shipping in the EU Emission Trading Scheme (ETS) and created a maritime climate fund in February 2017.

During the past year, the European Sustainable Shipping Forum (ESSF) created a new subgroup on Air Emissions from Ships. ESPO participated in the International Association of Ports and Harbors delegation in the IMO Marine Environmental Protection Committee (MEPC 71) where IMO agreed on a strategy to reduce greenhouse gas emissions from ships. In turn, MEPC 72 is set to work to approve the strategy and submit it to the stocktaking process of the Paris Agreement later in 2018. ESPO supports IMO's 2020 deadline for 0.5% sulphur



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cap, which aligns with the EU 0.1% Sulphur Directive which has already been in place across the Baltic and North Seas as well as in the English Channel since 2015. This is in addition to the Nitrogen Emission Control Area (NECA) that IMO committed to implementing in the above mentioned areas of northern Europe.

Emergency marine affairs, safety & security, and social dialogue

The accommodation of “ships in distress” in Europe is of growing concern for port authorities. ESPO continues to be active in the Places of Refuge initiative; however, it believes that the cost of accommodating such vessels incurred by the ports is a problem that needs addressing at the EU level. When a ship is diverted to a port, just accepting it and addressing issues related to human life and the environment are often not enough – the port also has to assist with vessel transport and repairs. As a result, the full cost of being a port of refuge is much greater than it is currently understood at the EU level.

Additionally, ESPO, along with other cruise stakeholders, contributed a joint response to the recommendations put forward by the Commission on ship and port security. The Organisation has also monitored throughout the year developments concerning the Port Reception Facilities Directive and participated in the GreenPort Cruise Conference on 10 October 2017 where issues relating to the environmental agenda of cruise ports were discussed.

The European Union’s Social Dialogue Committee (SDC) has been active in bringing port and sea transport workers and employers together to discuss issues related to employment conditions as well as productivity and competitiveness in the industry. Furthermore, the SDC is continuing work on “the changing face of ports: socio-economic impact of market-based and technological developments on EU ports” study. The study, in which ESPO has participated, measures the potential consequences of increasing the size of vessels on dock labour.

PORTOPIA

The Economic Analysis and Statistics Committee focused on the PORTOPIA project in 2017, which came to an official end on 9 November 2017 in Brussels. The PORTOPIA’s aim was to create a port management system for the European

Tab. 4. Share of port respondents offering OPS and/or LNG facilities, and having differentiate dues for “green” vessels at their ports in 2016-2017

Indicator	2016 [out of 61 respondents]	2017 [out of 91 respondents]
Is OPS available at one or more of the berths?	53%	48%
High voltage	20%	19%
Low voltage	47%	40%
Is LNG bunkering available in the port today?	22%	22%
Does the port offer differentiate dues for “green” vessels	62%	51%

in monitoring of those factors is offset by comparatively little attention being paid to terrestrial habitats with -1pp, carbon footprint with just +1pp improvement, and soil and sediment quality at just 6pp and 9pp change respectively.

The top 10 environmental priorities for port authorities (Tab. 3) are listed starting with year 1996. This is especially helpful to ESPO when working on their annual agenda because it highlights top environmental priorities in the port sector.

Perhaps the most noticeable change in the top environmental priorities is the new addition of climate change. Air quality, energy consumption, and noise have remained atop the priority list, while water quality jumped up few spots since 2016. Garbage/port waste as well as ship waste moved down on the list, but as was seen in environmental monitoring, the issue of waste is not being ignored.

The services to shipping category includes three factors determining the steps taken by ports to include more environmentally friendly shipping practices. Key services in this area include provision of onshore power supply (OPS) and liquefied

natural gas (LNG) facilities (Tab. 4) as well as breaks in port charges for using eco-friendly vessels (the so-called “green charging”). The Eco-Ports SDM checklist was updated to ensure the data in those three areas can be monitored. It should be noted that the current data includes a much bigger number of ports, which increased from 61 in 2016 to 91 in 2017, so the results might appear to be stagnant or decreasing when they’re actually increasing.

The sustainability report underscores the importance of the OPS high-low voltage differences. Realistically, with few exceptions, it’s the high voltage OPS that is needed to accommodate the commercial sea vessels (low voltage are used with inland, domestic, and auxiliary vessels). So the 48% answer is a bit too optimistic and the 19% of high voltage providers better illustrate OPS servicing, which is roughly one in five ports. The data also illustrate that awarding green vessels with fee reduction is already accepted by over half of ports, something that’s strongly promoted by ESPO’s Green Guide towards excellence in port environmental management and sustainability. ■

ports concentrating on data digitalisation. ESPO has lobbied to continue the PORTOPIA platform, considering the positive outcomes of this initiative. Additionally, the committee has worked to develop a standardised method for reporting modal split data, which is very helpful in meeting environmental goals and completing the TEN-T.

ESPO Award and the annual conference

Each year, the Organisation awards a port for best societal integration and in 2017 that award went to Guadeloupe

Ports Caraïbes for the contest themed “Art and Cultural Involvement of the port.” The award was given out on 8 November 2017 in Brussels at the Award Ceremony and Port Night.

ESPO’s annual conference for 2017 took place in Barcelona, 1-2 June. The theme was “Ports in a changing climate, a changing world,” and the conference covered issues related to climate change, trade, globalisation, and geopolitics. The 2018 conference will take place in Rotterdam on 31 May-1 June under the “Investing in the Port of Tomorrow” banner. ■



Adapt or else

by Petra Sörman, *Environmental and Sustainability Strategist, WSP Sweden*

The increasing temperature of the atmosphere causes the temperature of the sea to grow. As a consequence, sea levels are rising. By the end of this century, the sea will be one meter above the current point. Many areas in the world are already negatively affected by the climate change. Several islands in the Pacific have been claimed by sea-level rise, while parts of Miami, New York, and New Jersey are chronically flooded. One thing for sure, with time, seaports, including in the Baltic, will be more and more subjected to this new pressure, along with other extreme weather phenomena. How can we then make our ports resilient to climate change?

The greenhouse effect is something we have all heard of. What some may not know is the fact that without it Earth would not be habitable. However, there's a widely accepted consensus now that our planet's natural pattern of temperature fluctuations has been derailed by human activities, specifically the over-the-top use of fossil fuels to power the economy since the Industrial Revolution. Transportation, the scale and the way we produce our food, vast deforestation, etc. – all that bound together releases large

amounts of greenhouse gasses into the atmosphere annually. The changes due to rising temperatures are: increased intensity of rainfall, rising levels of both sea and groundwater, increased intensity of storms, and heat waves. All of them negatively impact the port industry.

Sink or swim

Regular floods cause damage to buildings, roads, goods, and equipment. They halt or impair operations, disturb traffic, pose a risk to health and life of employees, etc. As far as ports are concerned, recurrent severe flooding harm their reputation.

After all, who would like to cut deals with a business partner who cannot guarantee swift, undisturbed, and safe cargo handling and storing? Climate change may not be your fault, but it's up to you to deal with it – for your and your clients' sake.

What's more, insurance companies are starting to discuss seriously whether it's still viable to indemnify coastal areas. They can also put a premium on top of what used to be the standard price, forcing ports and terminal operators to react accordingly (or risk a lone struggle). In fact, in some places, insurance companies have stopped insuring against flood

risks, until the port has been climate-adapted. While these companies fully acknowledge that they have an obligation to provide insurance against unforeseen events, floods are nevertheless no longer considered by them to be that sort of incidents. All because of the permanent rise in sea levels and the fact that the return-period between floods has decreased. As a consequence, when insurance companies choose not to insure certain areas, it causes the market to decrease. Customers are shifting their activities either to other and more safe ports, or opt for another transport mode altogether.







It is very important that port managers, employees, and other stakeholders understand the risks and consequences posed by climate change. These will be different depending on local conditions, and the answer to how exactly your port can be affected – but maybe more importantly to what extent extreme and/or recurring weather events will impinge your operations (Tab. 1) – this can be investigated by modelling future sea levels in the context of your surrounding environment, existing infrastructure and superstructure, etc. In other words, one should undergo a risk assessment specifically focused on climate change. Afterwards, if the assessment says, “Yes, there’s a high probability that your port will be subjected to A, B, and C climate change-induced events which will in turn have such-and-such deteriorating impact on your business,” then you should take proper countermeasures in order for your port to swim rather than sink.

Find your footing

In essence, climate adaptation is about upgrading the existing buildings, infrastructure, and port machinery to make them sufficiently resilient. It is also about ensuring that new construction takes place in a safe and sustainable way, and resisting to the greatest possible extent the negative effects climate change might bring about in the future.

Implementing a climate adaptation programme may involve several different measures. The most well-known adaptation measures include building walls, levelling up the ground, or installing sluice ports. But there are plenty of other options. For instance, in places where storms are expected to become more frequent, you can invest in cranes that safely operate during stronger wind gusts. It’s also wise to expand on-site renewable and low emission energy

Tab. 1. Climate risks and consequences regarding ports

Climate variable	Consequences
 Increased sea level and intensity of rainfall	<ul style="list-style-type: none"> Capacity overload of the drainage system may lead to flooding and consequently erosion of road, railway foundations, pollution, flooding of stacking and stockpiling yards, and disruption of road access Extreme flooding could lead to loss of radar and radio equipment Damage to storage buildings and goods due to flooding Economic consequences when businesses have to close until the buildings and areas have been restored
 Increased intensity of storm surge	<ul style="list-style-type: none"> Increased wave action at waterfront structures and consequently an increase in overtopping rates, hence flooding of berth facilities Beach erosion
 Increased intensity of storms	<ul style="list-style-type: none"> Closure of linked modes of transport, affecting supply and distribution of goods to and from the ports Toppling of containers in stacking yards
 Heat waves	<ul style="list-style-type: none"> Higher risk of rail track buckling (stressing) Higher deterioration rates of pavements and roadways Higher energy consumption of refrigerated containers
 High speed wind	<ul style="list-style-type: none"> Damage to navigation and communication equipment Delays/stoppages to unloading/loading vessels Damage to older buildings and warehouses
 Other	<ul style="list-style-type: none"> Reputation of a port operator can be damaged in the aftermath of a severe weather incident Insurance premiums may rise due to growing global losses from weather-related incidents

generation to avoid risks associated with power disruption and increased costs of energy, as well as to meet environmental legislative requirements. Additionally, it’s highly advisable to protect electrical outlets and other important features of the power system from flooding. Next, you can upgrade and adapt your storage facilities to accommodate more extreme events, making sure that the most valuable shipments are placed in a low risk area. Roads and railways within the port may need to be raised to provide uninterrupted traffic once flooding hits. You can also ensure that climate change allowances are included in the future design specifications, including accommodating future rainfall requirements into new building designs and incorporating sea level rise and storm surge into all port infrastructure elements. Working in partnership with other ports, city governments, and supply chain logistics infrastructure providers is vital, so as to appropriately plan and design connected logistic hubs that are resilient to the adverse impacts of climate change. Nevertheless, some risks cannot be mitigated. In these cases, the risk may need to be outsourced to a third party through insurance. Last but not least, please remember that before implementing any solutions for climate change (which most likely will be CAPEX intensive and won’t deliver any return-on-investments until something bad actually happens), always complete a cost-benefit analysis to make sure that the investment you are about to take is worthwhile.

It pays off!

Without a shadow of a doubt, climate adaptation is proven to cut costs. These may be “sleeper” investments, but if nature really starts to wreak havoc, there’s no way to describe how lucky one feels to be prepared in advance.

If you’re already struggling with climate change or fear that the threat is just around the corner, look to others and learn from them how they’ve solved problems similar to yours. Do an assessment to identify the risks and the probability of them affecting your port. Follow up with a cost-benefit analysis to see whether it’s viable for you to adapt your port. In the end, it’s your credibility with the customers, insurance companies, and employees that’s at stake. ■

The Montreal-headquartered WSP is a leading engineering and environmental consultancy. It has one of the world’s strongest maritime engineering teams whose specialists are dedicated to planning, designing, and the construction of port, marine, and coastal facilities and infrastructure, using the latest technology to deliver future ready solutions. By combining technical, financial, and operational expertise WSP assists with the commercial decision-making process, minimizing the investment risk through the application of in-depth sector expertise. For more info, please visit www.wsp.com/en-GL/sectors/maritime





Facilitating public investments in ports

by Dr. Kai-Dieter Classen, LL.M. (Berkeley), Deputy Director of the External Affairs Division, Hamburg Port Authority¹

The application of state aid rules to ports used to be a case-by-case exercise. This is likely to change, for in May 2017 the European Commission amended the General Block Exemption Regulation (GBER), exempting certain public support measures for maritime ports from the strict notification requirement.



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Any public financial support to ports must be tested for prohibited state aid according to Art. 107 (1) of the Treaty on the Functioning of the European Union (TFEU). If the measure contains state aid, the Commission must be notified of that fact prior to putting it into effect (Art. 108 (3) TFEU). This requirement has produced more than 50 case-by-case decisions pertaining to the port sector. They reflect the large degree of diversity of European ports and of the projects under scrutiny, resulting in a very individual character of each decision. As a consequence, both big and small projects – like the construction of the €500m+ public investment JadeWeserPort or the refurbishment of Schumacher Quay in the tiny Port of Maasholm on the Baltic that cost less than €0.75m – had to pass the notification procedure.

The absence of sector-specific, legally binding state aid guidelines caused an additional degree of legal uncertainty. In its place, the non-binding *Commission Notice on the notion of State aid* (OJ 2016 C 262/1), in combination with the *Analytical grids on state aid to Infrastructure 2016*, is supposed to add clarity to the interpretation of Art. 107 (1) TFEU regarding the state-aid relevance of public investments in ports. While these publications certainly

help to reduce the number of notifications made due to legal uncertainty, they make no difference in cases where either uncertainty remains or state aid is present.

Cutting the Gordian knot

Against this backdrop, including port investments in the GBER might be putting the cart before the horse, because the Regulation deals with the legal consequences of state aid – not with the criteria to identify such aid. But, instead of further adding to the gridlocked abstract debate on when and under what circumstances public investments in port (access-)infrastructure constitutes state aid, this approach – based on the presumption that state aid is present – offers an alternative to the formal and potentially lengthy notification procedure. From a practical point of view, this manoeuvre is like cutting the Gordian knot. The GBER leaves the door open for an individual legal assessment of infrastructure projects regarding their state aid relevance, but its mere reporting requirements and monitoring obligations result in an enormous administrative facilitation as compared to the notification process, which is no longer compulsory if the measure fits under the GBER. The underlying rationale for the exemption of certain state aid measures from the notification



Photo: Jade Weser Port



Photo: Wikimedia Commons

requirement is that the Commission considers the measures contained in the Regulation *ex ante* to be compatible with the internal market – an assessment based on the experience gathered from the previously notified cases.

Conditions for exemption

After two rounds of public consultations in March and October of 2016, the Commission came forward with the final draft in May 2017, published as Regulation 2017/1084, “amending Regulation 651/2014 as regards aid for port and airport infrastructure (...)” (OJ 2017 L 156/1). The new GBER, which the Commission considers to top off its state aid modernization initiative, privileges public support measures regarding three areas: investments for the construction, replacement or upgrade of port infrastructures; investments for the construction, replacement or upgrade of access infrastructure; and dredging (always including planning costs). Aid for superstructures as well as industrial production facilities, offices, shops, or other non-transport related facilities are not covered by the GBER.

The term “port infrastructure” refers to an open list of port facilities which typically generate a direct income for the port because they are central to its economic activity. According to the GBER, “port infrastructure” means “infrastructure and facilities for the provision of transport related port services, for example berths used for the mooring of ships, quay walls, jetties and floating pontoon ramps in tidal areas, internal basins, backfills and land reclamation, alternative fuel infrastructure and infrastructure for the collection of ship-generated waste and cargo residues.”

The term “access infrastructure” refers, also in a non-exhaustive enumeration, to “any type of infrastructure necessary to ensure access and entry from land or sea and river by users to a port, or in a

port, such as roads, rail tracks, channels and locks.” These types of infrastructure typically require high investments and generate only an indirect, generalized income – if any – but are presumed to take part in the economic activity of a port under the scope of the GBER.

The inclusion of “dredging” was probably one of the most controversial points in the consultation. The updated Regulation defines “dredging” as “the removal of sediments from the bottom of the waterway access to a port, or in a port.” This definition makes no distinction between capital dredging and maintenance dredging, and thus covers all types of dredging.

To profit from the facilitation of the GBER, the public support measures must not exceed the notification thresholds. These are €130m per project in any port, or €150m per project in a TEN-T core port. In the case of dredging measures, a project is defined as “all dredging carried out within one calendar year”. It is up to the body responsible for a project to define the project according to its conception and well established standards. Here the body certainly has some discretion. The project may, however, not be split up artificially to circumvent the thresholds. While for dredging and access infrastructure projects the aid intensity can be up to 100% of the threshold, there is a staggered approach for port infrastructure, ranging from 100% for smaller projects (up to €20m) to 60% for big projects (above €50m). In any event, the aid may not exceed the funding gap of a project to avoid overcompensation. For small projects, not exceeding €5.0m, the GBER offers an additional facilitation; namely, instead of a precise funding-gap calculation, the maximum amount of aid may be set at 80% of eligible costs.

Further, aided port infrastructure which shall be the subject of a concession or other entrustment to a third-party for

construction, upgrade, operation, or rent has to be assigned in a competitive, transparent, non-discriminatory, and unconditional procedure. It shall be made available to interested users on an equal and non-discriminatory market terms basis.

Is everybody happy?

Even the consultation process for the GBER was very controversial. For every proposed rule and figure there were multiple voices lamenting that it was either too lenient, or not lenient enough. And the criticism did not cease after the Commission presented the final version.

While this chorus certainly reflects the diversity of interests in the port sector, it should be acknowledged that with the new GBER the Commission simply continues its generous permission policy developed in the port cases – now on a statutory basis. With the new GBER the Commission establishes a middle ground, rightly pointing out that the bulk of aid measures, which they would approve in a notification anyway, is now exempted by the GBER. A heavy load of cases, in which aid measures have no objectionable impact on the single market, is thus taken off the officers’ desks, allowing them to focus on the big aid measures, which have a potentially detrimental effect on competition due to their volume or procedural complexity, and are not covered by the GBER.

After years of debate and legal uncertainty the GBER now offers a clear path through the jungle of state aid law, brings about an enormous administrative facilitation, and altogether promotes a more stable environment for investments in ports. ■

¹ This article represents the author’s personal view



Photo: www.pexels.com

How to hire – and keep – the best

by Jari Hämäläinen, Director, Terminal Automation, Kalmar,
and Maaria Nuutinen, Vice President in Business, Innovation and Foresight, VTT (Technical Research Centre of Finland)

A superior user experience (UX) is relevant not only for the relationship between companies and customers, but also between companies and employees. In fact, it is a key factor in attracting and retaining the top professionals that today's companies need to succeed and thrive. Ports and terminals are not immune to these changes either, and solution providers can help the industry to keep up with the transformation required by the future workforce.

The concept of UX can create significant added value for companies designing products and services, or even enable radically new business and revenue models – all without adding much to the financial overheads involved. UX can be conceptualized in many ways, but the definition we adopted was that UX at work is the way a person feels about using a product, service, or system in a work context, and how this shapes the image of oneself as a professional.

Let's think about the previous sentence for a second. Traditionally the work environment in ports and terminals has been physically straining with noisy equipment and shift work. Could UX design actually be relevant for us as employers, too?

Wow-quality experience

The young professionals currently beginning their careers are the first generation that has grown up since childhood to expect a wow-quality experience from their devices and services. In the

real world, the consumer votes with their wallet and buys whichever phone, tablet, or computer they like best. In the workplace, the procurement department usually procures a set of standardized tools that meet a predefined specification at the most competitive price. But what does this mean for the UX of the employee? In any field, the best talents have the luxury of choosing between multiple prospective employers. How can we ever hope to attract them, if we are not able to provide them with the best tools – and, more importantly – a great workplace experience?

Here is where digitization of port operations can help. Automation enables working from the comfort of an office with advanced features and cutting edge technology. Remote controlling and computer gaming have similar aspects to them that are appealing to many and can provide the wow-effect future port workers are looking for in their jobs.

No more jobs for life

This is not just theoretical speculation. The entire concept of employment has been undergoing a gradual but radical shift over the last few years. Traditional lifelong careers in the service of a single employer have become a historical curiosity for today's young





Photos: VTT

professionals. Digitalization and the convergence of mobile and online technologies are transforming business models in every field, along with the ways we work, lead our teams, and interact with our customers. The UX is always at the very core of these developments.

Even in relatively traditional fields such as port operations and industry, the younger generation is accustomed to using modern online tools and smart devices, so we need to be able to offer them the same experience no matter what their field of work is. Physical labour, traditional working methods and outdated, painful-to-use business software simply does not cut it anymore.

We also need to remember that as employers, we are competing not just with the players in our own field, but with other industries as well. If you think this is

not relevant for your company, you may be in some trouble without realizing it. Top talents are always a scarce resource, and the choice between taking a job at a container terminal or a high-profile consulting firm could hinge on how well the employer succeeds in creating a high-quality work experience for their people. Are they providing the best tools for the job? Are they actively involving their staff in designing not only the products and services they sell, but also their own work? Are employees given genuine agency to manage the changes that they face together with their employers?

Motivated employees perform better

Great UX in the workplace helps create drive in everyday tasks, streamlines collaboration, and makes learning faster. And it tells a lot about how people are valued in

Motivated employees are a major part of ensuring strong results for any business; if you keep your employees satisfied, it is more than likely that they will keep your customers satisfied, too.

the company. Motivated employees are a major part of ensuring strong results for any business; if you keep your employees satisfied, it is more than likely that they will keep your customers satisfied, too.

Just as a wow-quality UX can't be tacked onto a product at the last moment, striving towards a superior employee experience needs to be a central part of a company's culture, if it is to have any hope of attracting and keeping the best talents in the industry, and getting the full benefit of what they can offer. Can we make it feel great to come to work at this company every day? Many companies clearly succeed in this, so why couldn't we – and you? ■

Kalmar is a Finnish originated  company, providing cargo handling solutions and services to ports, terminals, distribution centres, and heavy industry. Its equipment portfolio includes straddle and shuttle carriers, terminal tractors, yard cranes, ship-to-shore cranes, reachstackers, empty container handlers, and forklift trucks. The Navis terminal operating systems (TOS), Bromma spreaders, and Siwertell bulk handling systems are provided as part of the Kalmar business area. At the end of 2017, Kalmar had more than 5,700 employees in 30 countries. For more info please go to www.kalmarglobal.com

VTT Technical Research Centre of Finland is  one of the leading research and technology organizations in Europe. It provides expert research and knowledge services for domestic and international customers and partners. With over 75 years' experience, the centre supports its clients growth with top-level research and science-based results. VTT develops new smart technologies, profitable solutions and innovation services, cooperating with the customers to produce technology for business and society. VTT is part of Finland's innovation system and operates under the mandate of the Ministry of Employment and the Economy. For more info please click www.vttresearch.com



Photo: Kalmar



Waste-to-resource

by Vincent Favier, *Chief Executive, Ecoslops*

The World Ports Sustainability Program (WPSP) was launched in Antwerp in March of this year. This initiative aims at enhancing and coordinating future sustainability efforts of ports worldwide, as well as looking forward to fostering international cooperation with partners in the supply chain in support of the Sustainable Development Goals of the United Nations. WPSP members pledged to focus on five key areas: the development of robust infrastructure; climate and energy with the emphasis on initiatives that contribute to achieving the objective of the Paris Agreement on climate change; societal integration; safety and security; and ethical policies.

Mitigating the negative impact of their operations on the quality of air, water, and land, as well as the local community, has been a long-standing challenge for harbours. In its most recent environmental survey from October 2017, the European Sea Ports Organisation (ESPO) ranked port waste and ship waste among its top 10 environmental concerns (read more about ESPO's findings on pgs. 18-23).

Scale of the issue

Ship waste includes the hydrocarbon-rich sludges produced in engine rooms, bilge waters, oily ballast water, and waters from cleaning the cargo holds of tankers (so-called cargo slops). How much each vessel produces depends on the nature of its operations, the size of the ship, its maintenance, and age, as well as various other factors. Millions of tonnes of maritime hydrocarbon residue is created each year, accounting for an estimated 1%-2% of annual maritime bunker volumes.

All of this waste needs to be disposed of in line with IMO and EU regulations. Although many shipowners

dispose of their slops in accordance with MARPOL Convention 73/78 and European Directive 59/2000 regulations, the United Nations Environment Programme (UNEP) estimates that in European waters alone, at least 3,000 incidents occur each year in which slops are deliberately dumped, causing significant ecological and social harm. Indeed, illegal discharge in the world is anticipated to amount to 1.0mt per year.

Reception and treatment facilities for slops vary from port to port, with the initial aim of removing the oil from the water to produce an effluent which meets discharge standards. Treatment methods include gravity separation, physical or chemical separation, as well as biological or chemical treatments. The oily residues can then be treated or disposed of at or away from the port.

Don't throw it out, use it!

Ecoslops has developed a pioneering technology, the Petroleum Residue Recycling (P2R). Using this method slops are sustainably treated through a micro-refining process, in order to regenerate the waste into valuable fuels and light bitumen, which can be then sold back for use in different markets – also by the shipping industry.

After the water and sediment are removed, the slops are sent to the vacuum distillation column, where they are heated to 400°C. Under vacuum conditions, the hydrocarbons are vaporised and at the end of the distillation process several fuels are produced, including light fuel, distillates, and intermediate fuel oil. Due to the vacuum distillation process, Ecoslops is able to regenerate the heaviest part of sludges into light bitumen, which provides a new supply route to the construction and waterproofing industries.

This model developed by Ecoslops – in line with the principles of the circular economy – enables slops to be disposed of sustainably as well as regenerated into useful commercial products, with benefits for all levels of the slop's supply and disposal chain. The infrastructure challenges of slops' disposal are removed for ports, regenerating the waste product rather than burning it. This has a positive eco-impact as it reduces pollution generated by the port community. It also helps ports to improve their sustainability profile by enhancing their competitiveness as well as reputation in the eyes of their customers and wider stakeholders.

Shipowners and operators benefit from the reassurance that their waste is treated



Photo: Port of Sinès

appropriately and at a lower cost. In addition, they can improve their brand and reputation from the sustainable disposal and regeneration of their waste products. The recovered product is purchased from slops' collectors at a fair price, providing commercial benefits as well as alleviating the pressures on storage capacity. This also results in a decrease in the fees slop collectors charge to shipowners, as they once again have a valuable output for their slops. Industrial consumers receive high quality commercial products for their needs. Adapting recycled material boosts their own corporate responsibility and reputation.

Options for different size ports

Ecoslops' first refinery was opened in the Portuguese Port of Sinès, where the company also has a 15-year concession for the exclusive rights to collect slops from major shipowners (such as MSC) as well as waste waters within the port. The unit has proven its industrial efficiency by recycling and upcycling over 98% of the hydrocarbon residue collected and is now on course to reach its target of having a 30kt/year regenerating capacity. The plant can treat high- and low-flash waste as well as waste from oil depots and tanking or oil pipelines.

The implementation of an agreement with the energy company Galp was yet another significant achievement from September 2017. A dedicated pipeline connects the Ecoslops and Galp refineries at Sinès and is expected to deliver up to 10kt annually. According to an agreement with Total at La Mede-Marseilles, a 30kt – capacity unit should be operational by early 2019. This plant will also produce naphtha, fuel oil, and gasoil. The Amsterdam,

Rotterdam, and Antwerp zone will be served by a 60kt/year unit, due to begin its operations in 2020, that will be located on the site of the Antwerp Terminal & Processing Company (ATPC, a subsidiary of the Dutch VITOL Group) in the Port of Antwerp.

Among the significant developments outside Europe, a Letter of Intent has been signed with SSCO, a subsidiary of the Egyptian General Petroleum Corporation (EGPC), and a Memorandum of Understanding with the Suez Canal Economic Zone. Currently, a feasibility study is underway. Potential developments in Colombia and Singapore are being investigated, too.

Moreover, as a result of market feedback and continuous R&D, Ecoslops is planning the development of a mobile mini-unit with a capacity of 4.0-8.0kt/year. The mini-P2R will produce the same end product, but requires less land and operational resource. Designed to fit the same footprint as a 20' or 40' container, the unit will require two-to-four staff to man, will feature simpler controls, and will run on a batch basis. The technology will be operated under license, with Ecoslops being responsible for installation and maintenance. As such, the mini-P2R will be an efficient and affordable option for many small and medium ports which may lack the space for setting up refining and recycling facilities either within or outside the port. Projects are under discussion in Oman, Indian Ocean, some Caribbean islands, and North Africa.

Sustainable slops solution

The development and implementation of new technology are transforming all areas of the shipping industry and in particular its impact on the environment, including

“Environmental pollution is a global problem requiring global solutions coming from all sectors of the maritime industry. Ecoslops is working with its shipping, energy, and commercial partners to provide a sustainable solution for slops disposal by recycling waste into useful, commercial products.”

slops disposal. As the global shipping industry's tonnage increases in volume – and the difficulties facing slops disposal continues – the need for a sustainable solution in each port becomes ever more pressing.

Environmental pollution is a global problem requiring global solutions coming from all sectors of the maritime industry. Ecoslops is working with its shipping, energy, and commercial partners to provide a sustainable solution for slops disposal by recycling waste into useful, commercial products.

Minimising the environmental impact of ports and harbours by eliminating the need to burn waste, sustainable slops disposal will help in achieving the UN's ambitious Sustainable Development Goals. ■

The ambition of Paris-based Ecoslops is to establish itself as a major player in the treatment of hydrocarbon residue in a manner that fits the principles of the circular and sustainable economy. To achieve this, the company is implementing an innovative technology that allows optimised treatment of these residues into new fuels and light bitumen. For more info please visit ecoslops.com/en



Change the Channel

by Marie Pavesio *Communications and Marketing Manager, Marseille Gyptis International (MGI)*

It appears that data streams have become the new oil, thus making it possible to completely refurbish the economy. The rapid evolution of Artificial Intelligence (AI) and cognitive computing is going to revolutionise the digital synchronisation of physical goods, material flows, and customer interaction with logistics providers and their services. For those who know how to resource, refine, and leverage it, data unlocks as yet unseen opportunities to create new high-value services. So, what are ports of the future going to look like and how likely are port users to benefit from this change?

Many ports around the world are facing the same challenges linked to predictability of import and export cargo flows, as well as situations that can escalate into temporary or recurrent congestion impacting many actors in the supply chain. Human employees, even with the aid of conventional IT systems, sometimes just cannot cope with troublesome events that quickly start piling up. Artificial Intelligence uses IT systems to reproduce intellectual capacities comparable to those of a human faced with a complex situation, i.e. a problem which cannot be resolved using a simple, precise, or algorithmic methods that traditional IT could perform within an acceptable timeframe. At the minimum, an AI system can perform the same human tasks, but without the human error factor resulting from, for instance, everyday problems. Ideally, an AI could augment operations – on a constant basis – far beyond what humans would be ever capable of.

The flow of information to, from, and within ports comes from different sources that are either “traditional” (inputs from ordinary business systems, like on

transit times, fuel costs, revenue per TEU, etc.) or “non-traditional” (time sensitive records, such as concerning port strikes, weather dynamics, traffic delays, unexpected repairs, as well as large volumes of data generated from sensors, GPS devices, RFID tags, and traffic management systems). If we manage to acquire, store, and analyse this data – but above all make sense of it – new services can emerge to make the port industry in particular, and the supply chain business in general more performant, as well as more resilient against unexpected events.

Your 21st century's guardian angel

At MGI, we have coupled big data with AI to come up with an innovative service called Channel 5. It is a system designed specifically for port communities to make it easier for them to handle and streamline the ever-increasing flow of information, e.g. when it comes to taking decisions about the management of goods. This service not only acts like a watchtower informing users on the fluidity at the gate, but at the same time it's powerful enough to detect and analyse



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Taking advantage of Artificial Intelligence to improve port operations

potential problems. Channel 5's AI can instantly propose alternatives, so users can make appropriate changes and preempt a troublesome situation.

The idea behind Channel 5 is to merge data from our Cargo Community System (CCS) with data from different sources indicating events likely to impact transit flows, including weather forecasts, road traffic updates, handling equipment problems, any strikes within ports and terminals, and the expected volume of goods traffic. Data is then fed into an AI engine called ExpressIT, developed in partnership with CEA Tech (part of the French Alternative Energies and Atomic Energy Commission, a technological research organization backed by the government and ranked number No. 2 by Thomson Reuters among the list of 25 publicly funded institutions doing the most to advance science and technology in the world). ExpressIT is an expert software system, capable of collecting knowledge and reproducing human decision-making processes to help operators proceed. Essentially, our AI deals with events in a human-like fashion. It reasons: "When I'm in this specific situation, I need to take this specific action

Tab. 1. Main features of Channel 5

Who is it for?

- All ports handling containers, conventional goods, and ro-ro.

What services are offered?

- Real-time analysis and prediction of incoming and outgoing terminal traffic.
- System and traffic problem detection.
- Forecasting of the volume of goods expected for each period (incl. traffic congestion).
- System maintenance alerts.
- Troubleshooting for exceptional procedures; proposing operational alternatives and corrective actions.

Who are the users?

- Port authorities.
- Terminal operators.
- Hauliers and freight forwarders.
- Shipping agents.
- Information System managers.
- City and road users.

What are the advantages?

- Better efficiency for cutting operating costs.
- Reduced environmental impact of freight turnover and transportation.
- Strengthening the relations between transport industry players and making the port community more resilient and agile.



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All supply chain players – be them terminal operators, port authorities, road hauliers, shipping agents, freight forwarders, as well as their customers – all stand to gain directly from this new AI-empowered service.



or make this specific decision.” This information will then be compared with a set of port and logistics activity-based rules to assess whether operations are normal or disrupted, and to determine which players could be affected and by what sort of problems. As mentioned above, Channel 5 will then immediately offer alternatives in response to any difficulties.

On top of having an AI engine, Channel 5 is a bona fide information sensor that can constantly capture data from traditional and non-traditional sources. The more data we can capture from different sources, the more precise its predictive abilities will be.

Across-the-board

The use of Channel 5 will free up supervisors, whose activity is time-consuming and offers no real added value. In turn, these operators could extend

their scope of work to offer real-time diagnostics for any difficulties and recommend procedures to be taken in order to solve problems with e.g. shipments demanding exception handling. All supply chain players – be them terminal operators, port authorities, road hauliers, shipping agents, freight forwarders, as well as their customers – all stand to gain directly from this new AI-empowered service. Even more, port cities, their communities, and especially drivers will also benefit from a smoother and less error-prone traffic around the terminals.

At the end of the day, in the heated discussion whether Artificial Intelligence is or not a menace that will wipe out humankind, our company is simply putting on the market a highly useable tech-product that opens a vista for a completely new kind of win-win cooperation between the flesh and the silicon. ■

The Marseille-based MGI has been designing and implementing Cargo Community Systems (CCS) and Port Community Systems (PCS) for the port, airport, and inland transport communities for 30 years now. In its rich portfolio of IT solutions, the company has the Ci5 CCS, developed together with Thales Services in order to interconnect various supply chains using a smart door-to-door cargo worldwide track and trace information system that keeps goods flows on the move. For more info please visit www.gyptis.fr/en



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Sea Traffic Management project redefines the possibilities of a digital future

by J. A. Giménez, L. Calabria, G. Ferrús, J.M. Lara, N. Alonso, J. Arjona, P. Albert, *Valenciaport Foundation*

The Sea Traffic Management (STM) Validation project is a wide-scale European initiative focused on implementing new digital information exchange services for the shipping and port industries. STM comprises the third stage of this action that was initially defined during the previous projects MONALISA and MONALISA 2.0, all of which are co-funded by the EU within the Trans-European Transport Network (TEN-T).

The aim of the STM initiative is to push the maritime industry towards more collaborative and digitalised operational environments, enabling the transition of the sector to the so-called Industry 4.0 paradigm, where digital and real-time connectivity are the drivers for increasing efficiency, safety, and sustainability. STM is inspired by the aviation sector, where this evolution has demonstrated significant and measurable benefits.

Collaboration, communication, and collective planning

STM is a concept for sharing secure, relevant, and timely maritime information between authorised service providers and users, enabled by a common framework and standards for information and access management, and interoperable services. To achieve this, STM relies on four pillars: Port Collaborative Decision Making (PortCDM), Voyage Management (VM), Flow Management (FM), and Maritime Connectivity Platform (MCP).

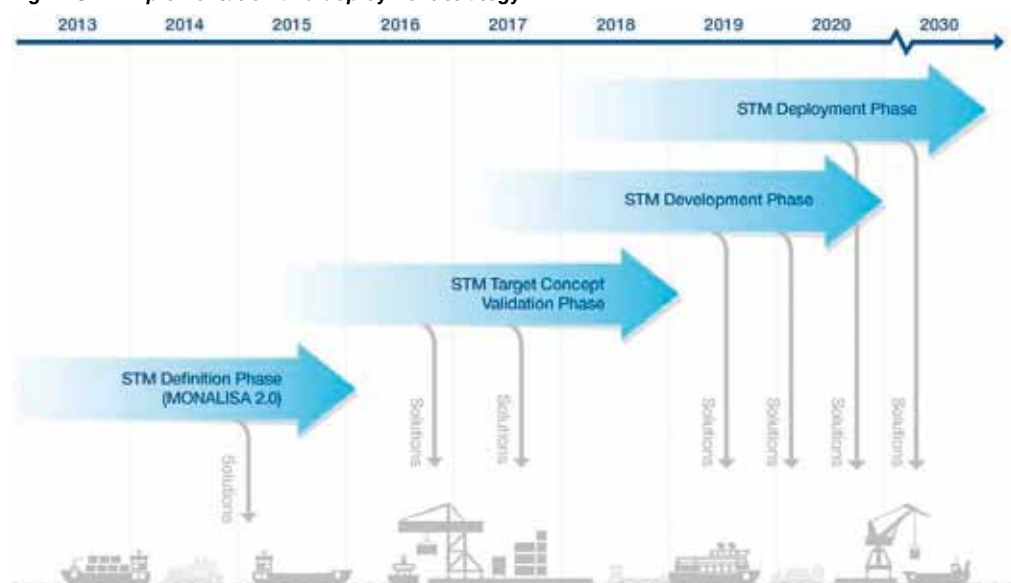
The overall goal of PortCDM is to support just-in-time operations within ports

and in relation to other actors, coordinated by an efficient and collaborative port. It is a way not only to establish a common view of all available information but also to use this information as a tool to create common situational awareness and to support the involved actors in making efficient collective decisions. PortCDM relies on continuous interactions among the maritime actors involved in a port call.

The VM part, in turn, concentrates on strategic, tactical, and operational decisions about the voyage such as planned and executed routes of a certain ship and its relation to nearby vessels in a given position. VM focuses on the initial planning phase of a sea voyage and the ability to monitor the execution of that plan. It supports improved route planning, route exchange, and route optimization before and during the maritime voyage. Especially in this phase, VM connects ships and adds intelligent processes and new tools enabling all stakeholders to increase their situational awareness within the voyage, providing faster, more secure, and transparent exchange of information.

“
It is a way not only to establish a common view of all available information but also to use this information as a tool to create common situational awareness and to support the involved actors in making efficient collective decisions.”

Fig. 1. STM implementation and deployment strategy



The FM component supports the optimal coordination of multiple vessels in congested geographical areas. FM will support both VTS control and ships in optimising overall traffic flow through areas of dense traffic or those with particular navigational challenges. FM's objective is to improve the overall flow of sea traffic through better information sharing and coordination. VM builds common situational awareness and enhances decision-making by providing information and advice about traffic and safety.

Lastly, the MCP provides a framework for the harmonization of data formats and standards for information management and operational services. It will support collaborative decision-making processes using efficient and end-user applications to exploit the power of shared information within STM Operational Services.

The project will demonstrate and validate the abovementioned target concepts by deploying large-scale testbeds in both the Baltic and Mediterranean Seas involving 300 ships, 13 ports, and five traffic control shore centres. Moreover, STM will demonstrate its benefits by taking advantage of the European Maritime Simulator Network (EMSN), a comprehensive network of ship bridge simulators, which will perform specific exercises to assess operational, safety and human factor aspects in a controlled environment.

Common framework

The STM concept becomes a reality through a set of standards and services that facilitate the information exchange among authorised users in a secure and real-time way. This is possible by establishing a common framework that confers standards for the exchange of information and access management to a set of interoperable services. These services include the route optimisation, ship to ship route exchange, shore-based navigational assistance, and enhanced monitoring.

Another of STM services, Route Optimisation, will provide continuous adjustment of routes according to cost, safety, and environmental parameters. Better route optimisation will lead to a reduction in fuel consumption as well as in the emissions of greenhouse gases (GHG) and other pollutants, along with an improvement in efficiency and cost-effectiveness. Better-optimised routes will also have a greater predictability, improving the planning of port services and the overall predictability of the maritime transport system.

The Ship to Ship Route Exchange service will enable particular route segments to be exchanged with nearby ships and with shore services to improve situational awareness and reduce accidents. The ability to exchange routes is one of the cornerstones of STM and an enabler for several other operational services.

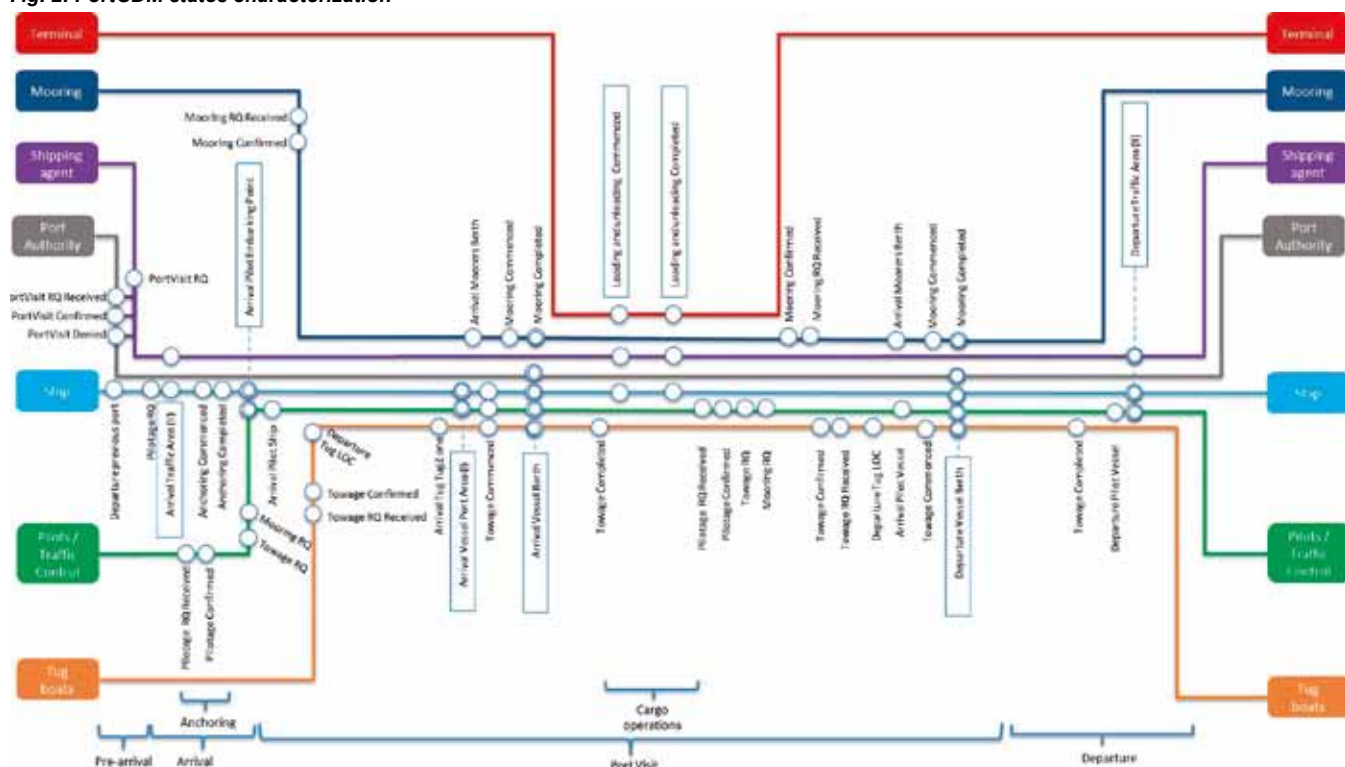
The Shore-based Navigational Assistance is a real-time monitoring service that will support on-board navigation, add a new tool to existing navigational services, and serve as an alternative to deep-sea piloting, thereby reducing the cost of a voyage. It will also improve voyage safety, especially in confined, sensitive, or densely trafficked areas. Navigation in sensitive areas can also decrease due to better support from operators with local knowledge.

The Enhanced Monitoring service will be improved by adding route information and more detailed services than present VTS; shore centres will be able to detect if a planned schedule is not kept or if ship deviates from a planned route. Shore centres can monitor whether ships are following their planned route and foresee possible dangerous situations, suggesting route modification (geographic and/or speed) due to traffic or other impeding conditions.

Situational awareness

Sea traffic begins and ends at a port, therefore, in order to reach STM performance targets, integration with ports is necessary. Inspired by a similar concept used for collaborative decision making within and between airports (known as AirportCDM),

Fig. 2. PortCDM states characterization



PortCDM is a way to not only establish a common view of all available information but also to use this information as a tool to create a common situational awareness as well as to support the involved actors in making efficient collective decisions. This will result in better planning of arrival and departure times and improve how a port interacts with a ship to optimise its port call.

To enable just-in-time operations, the various actors, who are engaged in sea transport-related activities, need to contribute to the creation of common situational awareness. This is achieved by capturing and drawing on information from different sources in a standardised way. Common situational awareness will maximise utilisation of port facilities and resources and optimise the use of energy (fuel/bunker) in steaming between two ports.

PortCDM relies on continuous interactions between the maritime actors involved in a port call – within a port and between a port and the stakeholders who deal with it such as ships, shipping companies, ship operators, ship agents, towage companies, pilot organisations, and terminals – who all need to coordinate closely in order to be efficient.

Fig. 3. STM Information Environment architecture



PortCDM helps to visualise specific stages of a trip to enable different operators to act in such a way that a port call (arrival, at berth, cargo operations, and

departure) can be performed on a just-in-time basis. The overall principle is that involved actors should be able to trust the prediction of when a certain state will be



Photos: www.pexels.com

The need for speed

by Poul Woodall, *Director Environment and Sustainability, DFDS Group*

Those of you who have followed for the past couple of years the discussion on greenhouse gas (GHG) emissions from shipping have no doubt come across the widely used claim that “a 75% reduction in GHG emissions is achievable by known technologies.” This statement is being repeated over and over again by lawmakers, NGOs, and other good people who wish to appear knowledgeable about this topic. It has unfortunately also crept into various official publications coming from the International Maritime Organization (IMO) and the EU.



Poul Woodall joined A.P. Møller-Mærsk as a Management Trainee in 1974 and, until 2010, worked there in various positions in Asia, the Middle East, and Europe, mainly within the container and ro-ro segments. Since 2010, Poul has been with the DFDS Group. In June 2013, he was appointed the company's Director of Environment and Sustainability. He has a degree from the Copenhagen Business School, supplemented with management education at Insead and Stanford University. Poul is active in a number of industry organisations, including Interferry, the Trident Alliance, and Green Ship of the Future.

Now, I just love to trace things back to their origins, and read the small print. So, what is the birthplace of this statement? Well, it comes from the IMO's *Second GHG Study*, published back in 2009, which bases its findings on activities during the period ending in 2007. We are therefore 10 years back in time, in an era hardly anyone remembers anymore.

So, what did this study actually say? “A significant potential for reduction of GHG through technical and operational measures has been identified. Together, if implemented, these measures could increase efficiency and reduce the emissions rate by 25% to 75% below the current levels. Many of these measures appear to be cost-effective, although non-financial barriers may discourage their implementation, as discussed in chapter 5.” This statement is qualified a bit later in the report by a table (Tab. 1).

A small but very important qualifier is located in a footnote, which reads: “Reductions at this level would require reductions in operational speed.” It is also noticeable that the reduction levels are not referred to in absolute terms, but in a tonne-mile denomination. It is not surprising that this conclusion is reached in this study, when you note the paper dates back to before the financial crisis

– a time when any oceangoing container vessel designed for less than 24 knots was considered totally inadequate to serve customer needs.

The concerning issue is that, even today, many still believe the 75% efficiency statement to be realistic. As if nothing has happened in the past 10 years! And, on this basis, some are calling for a global speed reduction programme to be imposed upon the sea shipping business.

World, we have a problem

The company I work for has been monitoring fuel consumption on a “per mile” basis for the past decade. On a like for like basis, the figure has come down by 17% during this period. This has been achieved without any significant speed reduction programme. It simply would not work for our type of business.

So, why do we want to discuss ship speeds? Well, the planet has a global warming problem, which is becoming worse with each and every day that passes by. Shipping actors, like everybody else, need to find ways to contribute to a genuine reduction in CO₂, but not on a per tonne-mile basis or the like. This needs to be done in absolute terms. The 800 million tonnes or so of carbon dioxide we emit annually needs to come down – and it needs to come down relatively fast.



Tab. 1. Assessment of potential reductions of CO₂ emissions from shipping by using known technology and practices

	Saving of CO ₂ /tonne-mile	Combined	Combined
DESIGN (New ships)			
Concept, speed and capability	2% to 50% ¹		
Hull and superstructure	2% to 20%		
Power and propulsion systems	5% to 15%	10% to 50%	
Low-carbon fuels	5% to 15% ²		
Renewable energy	1% to 10%		25% to 75%
Exhaust gas CO ₂ reduction	0%		
OPERATION (All ships)			
Fleet management, logistics & incentives	5% to 50%		
Voyage optimization	1% to 10%	10% to 50%	
Energy management	1% to 10%		

¹ Reductions at this level would require reductions of operational speed

² CO₂ equivalent, based on the use of LNG

Source: IMO's Second GHG Study (2009)

Otherwise, the problem will “solve” itself, crippling our civilisation.

This is where a compulsory speed reduction programme gets on the agenda. In the short- to medium-term, it seems there are no alternatives that will achieve anything even close to the potential for a speed reduction scheme. Two concepts appear to be discussed for a possible maritime speed reduction programme. First, an overall top speed limit. Second, a gradual reduction by mandating an X percentage reduction vs. the last period's average speed of the vessel. Of course, neither of these will work.

A shot right on target or in the foot?

There are many supporters of a global speed reduction initiative, including some NGOs, but I have yet to see a document suggesting a practical implementation guide for such a system. We need to move from a holistic view to ground level practicalities, if wide ranging support for a speed reduction is to be secured.

Why am I so adamant about this? Well, try to imagine the UN wanting to implement a global speed limit for cars. My guess is that most people would immediately argue this cannot be done and be able to provide a number of reasons for this. So, why should it work for ships?

The counter argument is that during the times of high oil prices and less economic growth, ships *did* slow down and emission levels were reduced. The key difference between then and now is that in the past the driver was cost – not GHG emissions. The same medicine does not necessarily work for two different illnesses.

In addition to the arguments you would use against a global speed limit for cars, the maritime context provides some additional scenarios. Most ships serve flows of goods and passengers all around the world. If you reduce the speed, you either need larger or more units to supply the same service. There is a limit to size in most cases, which means you need to supply more vessels. Sure, two 40,000 dwt bulkers doing 12 knots each would burn less than one vessel doing 24 knots. The issue is not always as clear-cut, however (think e.g. about ship manning). Moreover, there is still a significant movement of passengers via ferries, and for them time is often a consideration. How much would be lost to road and air transport if journey times were significantly increased? Such a switch would definitely not benefit the GHG emission levels.

Solution(s)

We need to approach a global speed reduction scheme with intellect. A viable system will be difficult to device, but that does not mean we should not try. Forced speed reduction may be *part of the solution*, but there are other issues one might consider as well. A lot of these are technical in nature, but a few are more structural to the industry.

The first that comes to mind is port waiting times. The time spent at anchorage, when a ship is waiting for a free berth or canal passage, could be converted into slow steaming. A plane will not take off from an airport unless it has a confirmed landing slot. Imagine the impact if we could mirror this system for ships. Yes, something can happen to

planes and ships while underway, a new slot could be allocated in such a situation.

Shipping goes back a long time and so does the way we manage it. The split responsibilities of the vessel owner and the charterer are fundamental and historically established. The norm in many contracts is that the charterer pays for the use of the vessel and, in addition to that, for the fuel. Could you imagine taking a taxi to go to the airport and, upon arrival, being told: “That will be 100 euros, plus a fuel surcharge of 25”? Yet, if you transport something by ship, that is often what you get. The fact that there is no clear and continuous ownership of vessel fuel cost makes optimizing in this area very difficult. Sorting out this responsibility would be the second item to be considered.

No shipping, no problem!

So, there are many topics for the industry still to address. Speed reduction is just one of them, and, in my view, perhaps not at the top of the agenda. That GHG emissions need to come down and figuring out how to eventually make the near-zero option real is not up for discussion. We must achieve that. The question is: what is the best way?

In fact, coming back to my origin tracking, “A 75% reduction in GHG emissions is achievable by known technologies” is of course an untrue statement. The figure should be 100% – one can just stop sailing! But who would agree to that. ■



Photos: Vistrato



Muddy waters

by Capt. Kevin Cribbin, *Technical and Content Director, Vistrato*

The International Maritime Organization (IMO) recently issued a warning that research presented by an industry work group found that a newly identified phenomenon in relation to the ocean transport of bauxite, when loaded on a ship under specific conditions, could result in a threat to the stability of the vessel.

The identification of the Dynamic Separation (DS) phenomenon by the Global Bauxite Working Group (GBWG) has been described as a ground-breaking contribution to maritime safety. Its report on *Research into the Behaviour of Bauxite during Shipping* provides a new understanding of a long recognised hazard posed by the carriage of what is known as Group A solid bulk cargo, i.e. cargo that may liquefy if shipped at a moisture content (MC) in excess of its Transportable Moisture Limit (TML). While this particular research applies to bauxite only, it is possible that other Group A solid bulk cargoes may also be subject to DS.

Safe until

Bauxite is the primary ore used in the production of aluminium, with some 100mt being transported by sea every year. The main exporting nations include Australia, Guinea, Brazil, and Malaysia, meaning that these are long-haul shipments subjected to many days at sea. It has been shipped safely and without incident for many years, but in 2015 the carrier *Bulk Jupiter* sank off the coast of Vietnam while carrying bauxite from Malaysia to China.

Only one of the ship's 19 crew members survived. The subsequent marine accident investigation carried out by the ship's flag state, the Bahamas, concluded that it was probable that either liquefaction or the free surface effect, arising from excess moisture in the bauxite cargo, caused the rapid capsizing of the vessel.

According to the International Maritime Solid Bulk Cargoes Code (IMSBC), liquefaction is considered likely to occur when a solid bulk cargo with an MC that exceeds its TML is carried on board a ship. The movement of the vessel during the voyage may cause the cargo to liquefy and develop a flow state leading to cargo flowing with the roll of the ship and potentially causing a dangerous list and sudden capsizing of the vessel. Apart from the *Bulk Jupiter*, a number of other bulk carriers have capsized and sank, with the loss of over 80 lives, when carrying cargo known to be prone to liquefaction, including iron ore fines and nickel ore (on the morning of October 13th, the bulk carrier *Emerald Star* suddenly capsized and sank in bad weather conditions in the Philippine Sea. Of the 26 Indian crew members, 15 were rescued and 11 are now considered to have lost their lives. The ship was en route from Indonesia to China with a cargo of nickel ore. Initial reports indicate that the probable cause

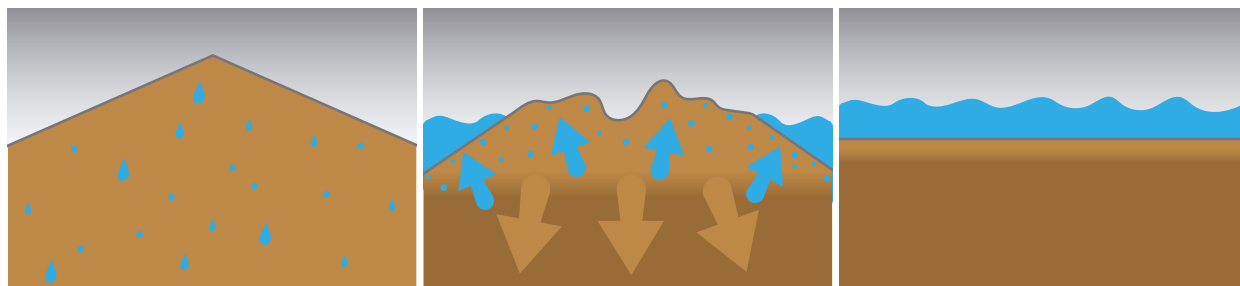
of the accident was cargo liquefaction/ Dynamic Separation).

Even though the 2016 edition of the IMSBC Code classifies bauxite as a Group C cargo, i.e. not liable to liquefy, the loss of the *Bulk Jupiter* and the findings of the Bahamas accident investigation have led the IMO's Sub-Committee on Carriage of Containers and Cargoes (CCC) to establish a Correspondence Group to re-evaluate the shipping characteristics of bauxite and consider any necessary amendments to the IMSBC Code. The already mentioned GBWG was then set up to carry out the necessary research and provide a peer reviewed report to CCC. The GBWG is made up of a range of industry representatives with wide experience in real world operations, including bauxite miners, shippers, alumina refinery and bulk terminal operators, ship-owners and operators, together with leading international consultants in geotechnical engineering, soil mechanics, and maritime research.

Breaking the Code

The shipping of solid bulk is governed by the IMSBC Code, which became mandatory worldwide on January 1st, 2011. The Code obliges shippers of solid bulk cargo to identify and classify the characteristics and potential hazards of their cargo and provide that information to the masters

Fig. 1. Dynamic Separation



Source: Vistrato

of the ships to be loaded. These hazard characteristics are classified under three headings: Group A (cargoes which may liquefy), Group B (shipments that possess a chemical hazard), and Group C (no special hazards).

Shippers of Group A (and B) cargo have a number of specific responsibilities regarding the provision of information regarding the cargo to be loaded to the ship's master or his representative under Section 4 of the IMSBC Code, including a: Shippers' Form for Cargo Information; Certificate of Moisture Content; Certificate of Transportable Moisture Limit; as well as a Certificate of approval from the Competent Authority of the port of loading, confirming that the shipper has established procedures for sampling, testing, and controlling cargo moisture to ensure that it is less than the TML when it is loaded on board the ship.

The propensity of a cargo to liquefy or develop a free liquid surface depends on its MC, TML, and also its particle size. The TML of a cargo is the maximum MC that is safe for carriage. It must be determined by a recognised entity approved by the Competent Authority of the port of loading using the test methods specified in the Code. Particle size is important as the risk does not arise when the cargo consists mainly of large particles or lumps so that moisture is able to freely drain from the cargo.

Dynamic Separation

The research carried out by the GBWG was presented to the IMO's CCC4 meeting this September in London, producing some radically new information on cargo liquefaction and its effect on ship stability. The GBWG's research has now established that bauxite shipments do not actually liquefy or develop a flow state in this way. Instead, it has identified a previously unknown phenomenon known as Dynamic Separation. It occurs when a bauxite cargo with an MC in excess of its TML and a high fines content slumps due to

the dynamic motion of the ship. As it settles and compacts, the water in the cargo separates and is expressed as a slurry to the cargo sides and surface.

With the settling and levelling of the cargo surface, the expressed slurry then forms a free surface liquid across the width of the hold. This causes a free surface effect resulting in an immediate, virtual reduction in the ship's initial stability. Depending on the number of holds affected and other factors, this can result in the rapid destabilisation and capsizing of the vessel. An early warning sign is the development of an atypical motion or "wobbling" by the ship.

In response, the IMO has issued a circular (CCC.1-Circ.2-Rev.1) with immediate effect. The circular includes a new draft test procedure for determining the TML for bauxite and new draft individual schedules in the IMSBC Code for Group A and for Group C bauxite. It is expected that the draft amendments will be adopted by IMO at its Maritime Safety Committee meeting in 2019 and that it will enter into force on January 1st, 2021.

Implications for shippers

Regardless of the fact that the IMSBC Code does not currently list bauxite fines as Group A, competent authorities of the port of loading are asked to consider the

draft changes in relation to Section 1.3 of the Code. Consequently Group A and C bauxites may be classified and TML tested in accordance with the guidelines and certificates issued accordingly. Shippers of Group A bauxite will then need to declare the cargo as Group A on the Shipper's Form for Cargo Information in accordance with the new schedule, carry out TML testing in accordance with the new procedure, and provide the master with the required MC and TML certificates. Bauxite that falls into Group A size criteria but is free draining, as established by the TML test, can be classified as Group C. Shippers of Group C bauxite will need to carry out periodic particle size analysis to confirm that the bauxite continues to meet the required criteria. Australia has already issued a certificate of approval for the new TML test method and is applying the new tests and Group A and Group C schedules to bauxites shipped from Australia.

It is in the interest of all involved parties to take care of bauxite shipments to the best of their abilities. It's not only precious cargo that's at stake. First and foremost we should be concerned about the lives of the crew in the horrifying event of a bulk carrier capsizing.



the Limerick-based Vistrato specializes in online training products for the dry bulk industry. The company's team comprises 3D animators, learning specialists, graphics, digital content creators, and master mariners. Captain Kevin Cribbin is Vistrato's Technical and Content Director with an accomplished career in the maritime industry and specifically in the operation of dry bulk ports and terminals. As a member of the DBTG, he contributed to the drafting of the IMO's BLU Code and drafted the BLU Manual. He represented RUSAL in the GBWG.

VISTRATO
enhancing
bulk terminal
operations

Dumb, dark, and disconnected

by Przemysław Myszk

The punchy title is a quote from ORBCOMM's Michael Dempsey, who during the latest TOC Europe characterised the container shipping industry as one that lacks strong visibility of its assets and cargo. This is a result of its, as well as ports', incapability to gather and process data efficiently, which in turn leads to massive waste, estimated by McKinsey & Company at around \$17b. While carriers are escalating their supply battle, hoping to resolve their hurdles with more of the same, a "strategy" defined by some as folly, maybe it's the right moment to take a U-turn and reinvent one's processes in the digital spirit of the modern times. It's never too late... Until it is.

The carrier, port, and terminal businesses have entangled themselves in the tree-forest paradox. Following the Great Recession of 2007-2009, which not only decimated world trade but also evened out the GDP-trade ratio, companies started to implement what they thought would be the best solutions *for them*. In their response, shipping companies have severely disconnected supply from demand by ordering ever-growing container ships. CMA CGM eyeing a series of nine 22,000 TEU vessels is the latest example of continuing to build one's hopes on the economies of scale. "First and foremost carriers make decisions and investments with a view to their own standing; the potential impact to the wider industry being a secondary consideration, if at all," Drewry, an independent maritime research consultancy, reported recently. On their side, terminal operators and port authorities jumped on the same bandwagon by investing heavily in new box handling facilities and all the associated on- and offshore infrastructure. This was understandable from *their perspective*,

because the competition across the Le Havre-Gdańsk range is no less fiercer as between the alliances and their members.

However, the problem is that all those actions did not benefit the wider supply chain. Quite the opposite – trade stayed at the same unsatisfactory for the carriers level, whereas the whole box carrier industry is still where it has been for the past several years, namely in the red (in the meantime, a few names fell overboard). In its reports, the International Transport Forum at the OECD has been calling attention to this tunnel vision negatively impacting the entire supply chain, stressing the fact that, in the end, mega ships cost more than they give in return. It seems, therefore, that the port and carrier businesses are failing to see the forest for the trees.

Bad things happen

But perhaps this is just the recession phase of the economic cycle and things will inevitably get better. Concerning trade served by sea shipping, this is highly doubtful. There's no sign of a new China emerging to fuel global growth, the globalization of supply chains has arguably reached its limits (bouncing back with reshoring in certain cases), while lowering tariffs won't take again the form of the

agreement from 1986, when 123 countries signed up to reduce them by some 40%. Moreover, threats of introducing protectionism policies are tossed around by a few officials these days, most probably US President Donald Trump who has the knock-down power of making the most damage to the world economy. At the same time, other more regionalized, immaterial, and resource-friendly economic models are incentivised, not exactly promising a sharp rise in ocean shipping volume (read more about them in the previous edition of BTJ in the article *New consumerism. Emerging ethical economy as a response to modern day problems*). All in all, "Don't count on an easy return to the days when trade increased 2.0 to almost 3.5 times faster than GDP," John Murnane underlined in his paper *Ports and shipping: The need for solutions that cross lines* (for more info on the GDP-trade ratio impacting the transport industry also read BTJ 2/17's *Calculating the future. Transport outlook to 2050*).

Interestingly, the all-time low freight rates do not please shippers, either. It's true that bigger vessels consume less bunker per cargo unit, but because of the cutthroat rivalry haunting the carrier business, the lower fuel bill has been translated

into price breaks for shippers – not for service improvements. And while according to McKinsey & Company, American shippers alone saw a total of \$23b in savings over the 2010-2015 period, the “service is bad and shippers are angry,” Murnane pointed out. The new normal is forcing carriers, he went on, to admit the fallacy of the entrenched idea “that all customers care about is the rate they pay – the price per container.”

Shippers are willing to spend more if they receive better service – higher transparency, advanced communication, increased reliability, enhanced visibility, and finer exception handling. And if clients can’t get that from traditional carriers, they either turn their eyes to Non-Vessel Operators or take matters into their own hands. This is exactly what Amazon has been doing for some time now. The days when the company had only fulfilment centres in its logistics portfolio are far gone. Amazon has now an ocean freight forwarding licence in China and its Chinese subsidiary has registered for a corresponding US one; it also has a fleet of trucks and planes at its disposal, as well as has eyed buying the Frankfurt-Hahn Airport to establish its own air freight hub in Europe (in its homeland, the company is currently building a \$1.5b worth hub in Kentucky). Effectively, Amazon wants to cut out the middle men, and it seems both the likes of DHL or UPS as well as the shipping lines. Cutting the costs and making one’s operations more granular are the two most obvious reasons behind this move; however, Amazon has since its very beginning (1994) been an e-commerce business, not hesitating to build up its operations with such innovations as automation and robotics (operating 45 thousand robots in the US alone at the beginning of 2017), or the cloud (Amazon is said to currently have the most cloud computing power in the world). In other words, the company has digitisation embedded in its DNA.

Traditional shipping companies may discredit Amazon because it lacks the patina covering many of their names. In response, Jeff Bezos’s company can create a transport and logistics service that fits the needs of the 21st century market far better than another batch of gigantic hulls would do (e.g. clients praise the Prime service which is so much more than just fast delivery). Despite its deeply-rooted aversion to change, the port and shipping industry is starting to realize that there’s no escape from market evolution



A FULLY-FUNCTIONING SUPPLY CHAIN REQUIRES **VISIBILITY OF ACTIVITIES AND CONNECTIVITY** BETWEEN STAKEHOLDERS, BUT...



82%

feel the level of connectedness and visibility needs to be improved



12%

feel there is virtually no visibility

THEY SAY **THE BIGGEST CHALLENGES** PLAGUING THE INDUSTRY INCLUDE:



57%

Poor coordination between partners



50%

Too little transparency and visibility



37%

Inefficiencies within the supply chain

devouring all those except the fittest. Not the biggest, the wealthiest, or the wittiest – but the fittest.

A common standard

The inefficiency, waste, and old business practices in the port and carrier industry are to be combated with the use of the latest technologies, reads the key takeaway from the *Competitive gain in the ocean supply chain*, a global survey of over 200 executives and professional from the maritime business, jointly conducted by the BPI Network, the CMO Council, Navis, and Xvela.

To start with something, the lack of true multi-node cooperation is one major cause of the sector’s weaknesses in adhering to the new GDP-trade normal. This stems not only from the industry players’ inherent mistrust towards each other, and this holds true even for members gathered

within one alliance, but also from old IT systems. The aging Electronic Data Interchange (EDI) infrastructure is “notoriously inflexible” and “incapable of real-time data sharing.” Ron Widdows, Chairman of the World Shipping Council, told the authors of the *Competitive gain* paper in this regard, “Any technology that can free this industry from its horrible reliance on EDI – with its armies of people scrubbing bad data and with its missing and untimely data – will be useful.” The value of accurate data cannot be underestimated, e.g. when it comes to coordinating vessel port arrival. On the US East Coast, ships arrive on the dot only in 30% of the cases (the best reach the level of approximately 80%, which says much about the sluggishness of others). On average, captains’ arrival

**DESPITE HURDLES, STAKEHOLDERS AGREE THAT REAL-TIME ACCESS
AND SHARING OF INFORMATION IS VITAL:**



THE AREAS MOST IN NEED OF PROCESS IMPROVEMENT ARE:



estimates differ by 13 hours from the actual berthing. “As ships get larger, and they continue to show that level of unreliability, it creates enormous strain on the whole system. If you can’t count on a ship arriving on time, you won’t have a place for it to dock, or have enough room on land to unload it, or appropriate space to hold the boxes... The net result is an inefficient operation,” Rich Ceci, Senior Vice President of Technology and Project at the Port of Virginia, emphasised the consequences of bad data for logistics. This can have a snowball effect on the entire supply chain – delays impair the operations of freight forwarders on which importers and exporters rely on. “What we see is that the end consumer [...] is kind of left out of the loop. They don’t get the visibility they need of where the cargo

is between point A and B and when it’s going to ship. What’s really needed is to find a way to bring them into the loop – actually give them better visibility, traceability and notifications, like you get with a FedEx or DHL-type service,” Mark Wootton, Chief Information Officer of Yilport Holding, said.

A common standard for data exchange is the simplest answer to this headache. However, the majors in the carrier business developed their own proprietary systems in the past, which do not talk to each other, nor are easy for other players in the supply chain to juggle around for their own purposes. Moreover, the idea of a shared platform rises the questions of data protection, security, integration challenges, the cost of setting up and adapting to the whole thing, competition, etc. Will alliances change this situation? Well, it depends. On the one hand, “Our people generally don’t want to share by nature. Carriers within alliances don’t even share with their alliance partners unless they absolutely have to. They don’t trust each other,” Ron Widdows said. On the other, Widdows added, “The operating costs will eat them up if they don’t, and they will find it difficult to mount any kind of differentiation of services and capabilities.” Mark Wootton is sceptical about carriers and alliances working together towards a common standard. According to him, we’re much more likely to see a round of developing new but separate systems. Time will tell if we are to witness a format war just as other industries did in their past (e.g. direct vs. alternating current, standard vs. broad rail gauge, or Blu-ray vs. HD DVD).

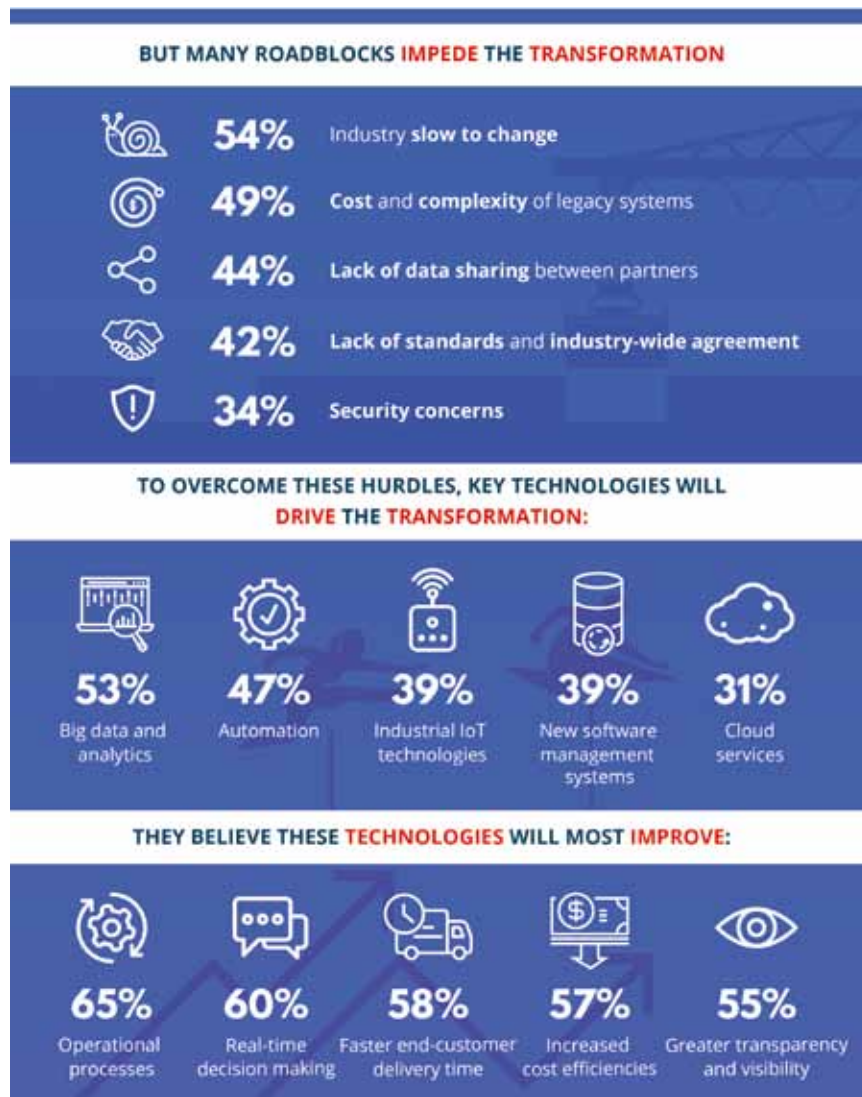
Port authorities, which are, after all, managing entities that gather in one place diverse actors from across the supply chain, have the potential to bridge this distrust gap (also see BTJ 3-4/17’s *opPORTunity. Harbours technology towards Ports 4.0*). Ports themselves will feel an increased pressure put on their performance. The transport and logistics industry still remembers how pre-crisis port congestion negatively impacted their operations. Fears of congested seaports were recently raised again, as well as magnified by the introduction of



Photo: www.pexels.com

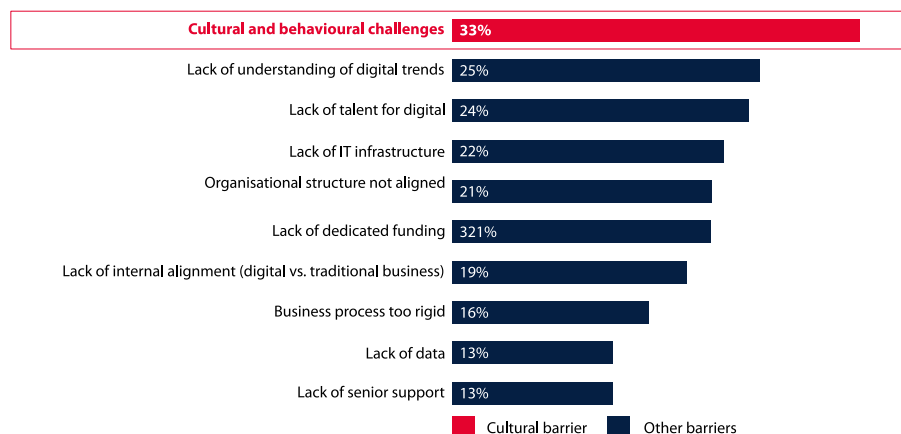
mega vessels. As urbanization appropriates available land, in-city ports will be compelled to increase their capacity utilization. Automating cargo turnover is one answer to this demand, all the more profitable if authorities succeed in transforming their port community systems into a “cloud of clouds”, an ecosystem encompassing the port, terminals, shipping, freight forwarders, shippers, as well as importers and exporters. Antwerp is pioneering this approach. A company has been set up involving the port and all the transport sector players in and around it in order to build an end-to-end chain of data sharing – from ocean to pilot to berth to yard to gate to rail to truck to beneficial cargo owners, and vice versa. In the Baltic, the Estonian Logistics and Transit Association and the Estonian Purchasing and Supply Chain Management Association Prolog are developing a joint single window info platform for parties involved in the country’s transport and logistics chain. This initiative is part of a wider project called X-Road, which is a technological and organisational environment enabling a secure Internet-based data exchange between different information systems. X-Road is said to save Estonians 800 years of working time per annum.

“Everyone benefits from collaboration and data sharing. It starts with the customers and moves to the carriers, then to terminal operators, vendors, freight systems, truck companies, and keeps going down the line. There will be no losers, only winners when the industry comes terms with the need for collaboration. The good news



Source: Competitive gain in the ocean supply chain (June 2017)

Fig. 1. Which are the most significant self-reported barrier to digital effectiveness [% of respondents]



Source: 2016 McKinsey digital survey of 2,135 respondents

is, there is much more open-mindedness in the industry compared to even just a few years ago,” Andreas Mrozek, Senior

Manager of Global Marine Operations at Hamburg Süd, said in the *Competitive gain* paper.

Commercial excellence

Open-mindedness is by all means a sought-after virtue, particularly in an industry known for its dislike towards derailing the business as usual approach. Nevertheless, “When we talk to the lines everyone agrees that change is imperative. But when we discuss the operational details with the local offices, change is slower because the cost and initiative to make the change lies with them,” Michael Yip, Chief Innovation Officer at Modern Terminals Ltd., commented shrewdly in *Competitive gain*. His remark drops a hint that it’s not only the case of visionary leadership or the lack thereof, but also the issue of talent gap. After all, it’s far easier to implement a change if you have people with the right competencies, who

also “feel” the tech-pulse (brutal as it might sound, but sometimes you just can’t teach an old dog new tricks; Fig. 1). According to Gartner, a research and advisory firm specialising in technology and IT insights, one-third of all tech jobs will go unfilled by 2020 because of talent shortfalls.

What the industry needs, therefore, is to embrace the “make it happen” approach, so as to work towards achieving what Murnane calls “commercial excellence”. However, it’s not only about grasping the opportunity of clients willing to pay more for a premium service, but also putting the responsibility in the hands of those who generate waste. In this regard, Murnane proposes introducing tiered pricing, e.g. charging more for peak berth windows, poor stowage plans, as well as making larger vessels pay more, since they require more time to pilot, berth, and handle. According to him, this variation of the

polluter pays principle would cross out some \$ 2.0-3.0b of waste. “Ports are seeing a real, positive impact when they start to implement these kinds of ideas,” Murnane wrote in Ports and shipping, giving then some examples: “Increasing the utilization of machinery by 3% to 5% when they charge different prices for day and night operations and by an additional 12% to 15% when they introduce fines for unattended truck windows.” Then again, Murnane echoed Yip’s words, “The hard part isn’t the math but rather getting all the different stakeholders to work together.” The questions is: how would ports and terminals sort this out between them, so that carriers wouldn’t play them against each other?

Perhaps

Over the past couple of years, the environment surrounding the transport and logistics sector has changed considerably, and so should the industry. Because the sea container shipping business has been slow to do this, others started to fine-tune

to its lack of adjustment. These include Amazon starting to add its own transport service network to the company’s e-commerce core, as well as the growing number of companies that are unfolding the shipment boom across the New Silk Road (we wrote more on this in the Focus section of BTJ 6/16; similar to Amazon, Alibaba and JD.com, China’s two biggest e-commerce companies, want to e-commercialise the New Silk Road). “One thing is clear – authors of the Competitive gain summed up their survey – those players who fail to act risk being left behind and overcome by more innovative competitors, as well as new market entrants and business models.”

Is the world trade imaginable without ocean shipping? Certainly not. Is it sustainable the way how it works nowadays? Also not. Can it continue to be recklessly “dumb, dark, and disconnected”? Again – no. Can we think of it being run in the foreseeable future by names other than those hitting today the sometimes more than disturbing headlines? Perhaps. ■



Photos: Amazon



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In the stage of denial

by Frank Coles, Chief Executive Officer, Transas

As I sit at my desk, I find myself shaking my head asking myself why so many in maritime do not “get it”. I can only conclude that while people happily read about impending transformation of our industry, they do so in the misguided belief it will only affect others – and that they somehow remain insulated.

Almost every industry event today is abuzz with an assortment of technological jargon and concepts, many promising operational savings that verge on the magical. Veteran observers and members of the industry, of course, were rightfully sceptical of such snake-oil claims.

But it's no wonder people are confused. On top of the technical innovations aimed at boosting operational and navigational efficiency there are environmental solutions being pushed on to shipowners to satisfy the whims of the industry's regulators. Then there are more remote and autonomous ship proposals and development projects than even Elon Musk could shake a stick at. We have numerous start-ups and venture companies all rushing to offer digital widgets or applications that promise to break the status quo in the chartering business and rewrite the rules of engagement for transporting goods over water.

Innovation delayed is innovation denied

My view, however, is that the industry is in denial. Most players are either failing to see what is coming, or are pretending not to see it in the hope it won't happen. The market for

maritime assets, aka ships, has run out of steam. Recurring stints of oversupply reveal an industry that is unable to manage itself, unable to modernize, or make real progress despite the technological revolution happening around it (read more in the article *Dumb, dark, and disconnected. Addressing waste efficiency in the supply chain with technology* on pgs. 44-48). So, it is going to be disrupted.

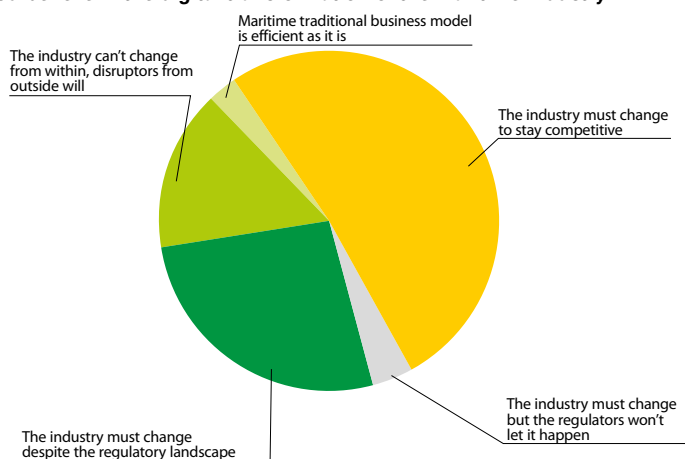
The business model has to change and it will be painful. Innovation can be described as the improvement that occurs from within. Disruption, on the other hand, is change imposed from outside. The former is incremental, while

the latter rips up the present model and starts again from scratch.

Amazon has a missile aimed at the global shipping industry. Last year it put into action the Global Supply Chain by Amazon, a blueprint for a global shipping and logistics operation, which leverages the power of vertical integration to take ownership of the total value chain. Its logic is that such ownership is necessary to deliver the speed, convenience, and the lowest possible prices that are the core strengths of its business model.

In Amazon's own words, it will be a “revolutionary system that will automate the entire international supply chain and

Fig. 1. Do you believe in the digital transformation of the maritime industry?



Source for all figures: Transas

Fig. 2. What challenges does your company face in the digital transformation process?

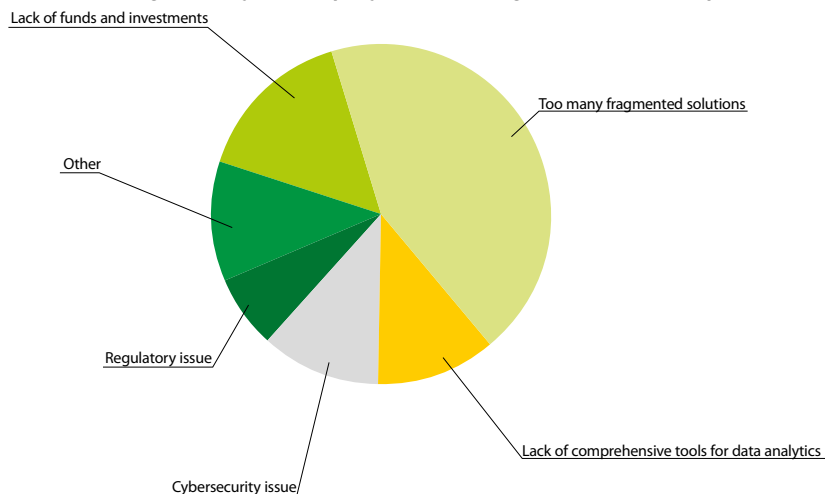
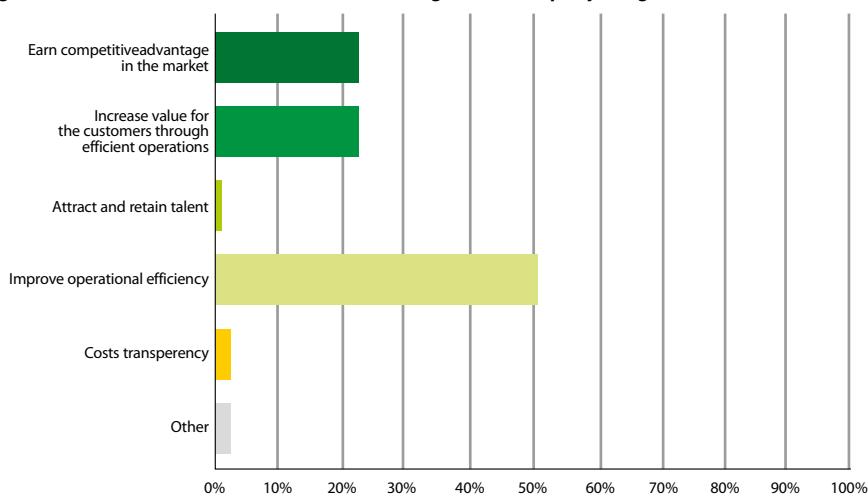


Fig. 3. What are the main drivers when investing in the company's digital transformation?



eliminate much of the legacy waste associated with document handling and freight booking.” If this comes about, the world’s largest e-retailer will have its own logistics and distribution hub, challenging not only land-based shippers such as FedEx, UPS and DHL, but also the middlemen handling paperwork and cargo associated with shipping worldwide. Amazon is already partnering with third-party shipping carriers to advance its global operations. Once it has mastered the shipping model and achieved the necessary scale, it will jettison its existing partners and run it on its own.

Another example of Amazon’s Pac-Man personality of gobbling up markets is its aggressive position in cloud computing services. This vital back office service started quietly as an internal project. After opening the platform up to the market, it quickly expanded to become the company’s fastest growing

and most profitable business. In the light of this, Colin Sebastian, an analyst at the financial services and investment banking firm Robert W. Baird & Co, has described the e-retailer’s global supply chain ambitions as a classic Amazon move. “They take baby steps along a long path, which allows some companies that could be disrupted to remain in a sense of denial. Amazon rarely takes one big step forward that shocks the market,” he wrote in *Forbes*. In his view, Amazon’s ambitions could translate into a \$400b business.

The subterfuge

So, what happens to maritime? If other transport industries are any indication, Amazon and its ilk will want a technologically advanced, highly efficient ship, built for purpose, and preferably unmanned or autonomous. Today’s tonnage will not make the grade;

neither will today’s operational or management practices.

Shippers themselves, they will drive the change, not the industry’s regulators or the vessel owners struggling to shave an additional percent or two off their costs. The whole environment within which manufactured goods are delivered could change forever, going on to radically reshape the business of shipbuilding and affect the sort of technology on board ship. This could even prompt the demise of some insurers and classification societies, as well as freight forwarders and many other third-party businesses that support the operation of maritime assets and the carriage of cargo.

In the meantime, the hyperbole surrounding cyber-security, Internet of Things, and bandwidth is largely irrelevant. All industries face these challenges and are stepping up to address them – so why can’t maritime? Vessel navigation and operation will adapt and evolve to fit in with these new norms.

Most commentary on the state of the industry, its adoption (or not) of technology and the regulatory pressure it is under is framed in the context of today’s business model. My fear is that remaining within the walls of today’s maritime space simply ignores the fact that the industry is about to be disrupted by a Trojan horse.

Scan the QR code to access Transas’ YouTube library, incl. videos about the company’s solutions, as well as footages from its THESIS conference



Transas was established in 1990 in Ireland by a small group of professional seafarers and engineers, enthusiasts of maritime computing technologies. During the next two decades the company capitalised on its experience in creating high-tech innovative products and solutions to open up new areas, incl. technical simulators, integrated bridge systems, monitoring solutions for the offshore oil & gas industry, mobile apps for the leisure market, pilot applications, fleet management, and many more. Transas also organises its own conference (#THESIS18) on transitioning from smart talk about technology to practical solutions. For more info please go to www.transas.com



Photo: Hapag-Lloyd

Innovation, disruption, or destruction?

by Katarzyna Chmielewska

Technology has long benefited the parcel and express industry by helping global integrators, postal companies, and regional deferred deliveries increase their competitive advantage to create strong logistical networks and achieve high-density distribution. However, a recent industry analysis shows that technological advances, like delivery robots, driverless trucks, or data-driven customer familiarity, are likely to upheave the industry in the next five to 10 years.

The first wave of digitalization from the 1990s and 2000s facilitated the growth of the delivery service sector because it boosted e-commerce and business-to-consumer (B2C) volumes. However, the second wave, characterized by such innovations as cloud-based data and analytics, augmented reality, driverless technology, and modular software, might as well disrupt it. According to a report titled *How a Digital Storm will Disrupt the Parcel and Express Industry*, authored by the Boston Consulting Group (BCG), there are five possible disruptors on the horizon, namely e-commerce expanding further and farther; the rise of the so-called Network 4.0; changes in last mile operations; growing consumer-centricity; as well as the break-up of the value chain.

Shifts brought about by these innovations will be disruptive rather than destructive, and will vary from segment to segment. Accordingly, not all delivery companies will equally benefit from this change in fundamental sources of competitive advantage, and we may soon see their market power and profit margins erode, as the entire industry shifts to a different model of operations.

E-commerce

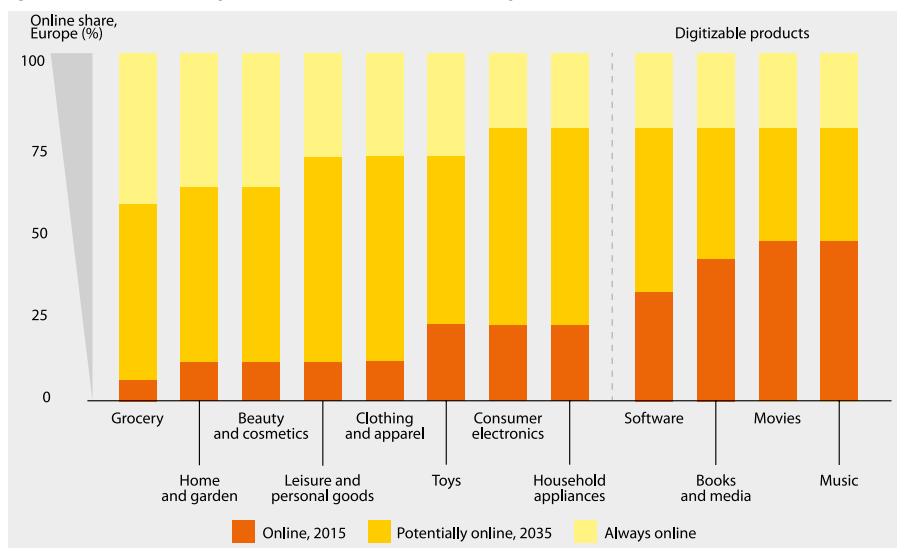
To start with, the B2C e-commerce volume will triple over the next 20 years, with as much as 70% of retail spending migrating online. With the B2C volume increasing, the flattening of the scale curve will decrease the drop density advantage of market leaders. E-tailers will be able to extend their breakeven delivery zones to medium cities and suburbs. E-tailers moving down the delivery chain could threaten postal companies, which tend to dominate B2C. The position of current parcel market leaders can also weaken for a surprising reason, namely as an effect of the growing popularity of online grocery shopping, which in turn could allow e-tailers to add non-urgent non-food parcels to regular grocery deliveries at little marginal cost. To remain competitive, postal and established parcel companies will have to offer more flexible pricing and operations.

Moreover, even companies dominating the business-to-business (B2B) market will be affected by e-commerce. If there's enough volume in B2C, new and old B2C players can "use their scale to move into B2B delivery in the areas where B2B and B2C receivers are geographically mixed," states BCG's paper. So far, e-commerce



B2C e-commerce volume will triple over the next 20 years, with as much as 70% of retail spending migrating online.

Fig. 1. Potential development of e-commerce in Europe in 2015-2035



Source for Figs. 1-2: Boston Consulting Group's *How a Digital Storm will Disrupt the Parcel and Express Industry* (2016)

has been helping big parcel companies, but in the future the growth may have different consequences for each of the segments of the parcel and express industry. "B2C parcel companies will have better chances in B2B, whereas e-tailers, B2B parcel companies, and grocery giants will have better chances in B2C. Boundaries will blur, creating a more level playing field and putting current leadership increasingly at risk," conclude the report's authors.

Network 4.0

A more level playing field is not the only change the industry will need to adapt to. With the advent of Network 4.0, standing for technologically-enhanced collection, sorting, and driverless line-haul,

competitive dynamics may change even further. Of all the aspects of Network 4.0, driverless line-haul is believed to have the biggest impact on the delivery models. It can eliminate the need to funnel parcels to central locations on their way to delivery depots by creating a straight connection between the spots of origination and destination. Sending parcels directly to delivery depots will reduce transport time and the costs. Based on this, the BCG report contends that autonomous line-hauls can potentially reduce the current cost advantage of 20% of hub-and-spoke models into a 30% cost disadvantage. Additionally, the point-to-point networks will offer higher reliability as well as later drop-off times.

Sending parcels directly to delivery depots will reduce transport time and the costs, and autonomous line-hauls can potentially reduce the current cost advantage of 20% of hub-and-spoke models into a 30% cost disadvantage.

To remain competitive, parcel companies will need to do more than re-think investments in hubs; they will need to tackle a comprehensive network re-design. Global integrators can now switch to a point-to-point network with multiple smaller depots, but they would still have to deal with heavy investments in fixed assets. Postal companies have a more distributed network that could be the base for a more flexible spoke-to-spoke network; however, they "lack the labour flexibility or the geoanalytical modelling expertise." So, all companies, the paper reads, should "stress test their investments using different 'autonomous trucking' scenarios."

The last mile

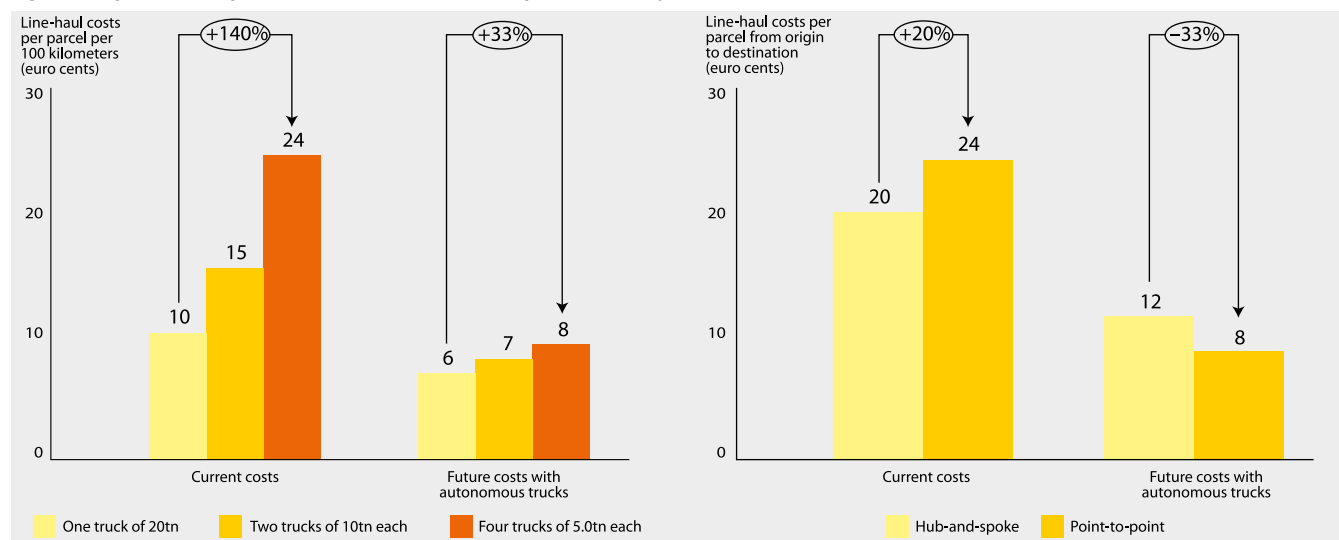
Re-inventing last mile operations can become the road to success for newcomers that will tap into the opportunities offered by technological innovations. Combining such technologies as driverless vans, aerial delivery drones, sidewalk delivery "droids," and pick-up lockers will offer the "largest potential cost reduction" of last-mile B2C costs. The required investments in such technologies, however, can be too big for many smaller parcel companies. For that reason, postal companies can lose their dominance over the local market share in B2C. Since many companies will not be able to develop and deploy last-mile technologies, "the key source of competitive advantage may shift in the next decade from scale in local drop density to scale in global investment." Consequently, this change will mostly benefit large e-tailers and global integrators.

Receiver familiarity

Knowing individual consumer preferences is the key to future competitive advantage. Parcel companies have a leg up on their competition since they "typically have the most information on receivers'



Fig. 2. The potential impact of driverless line-haul on parcel delivery costs



schedules, the densest retail network for enabling other contacts, and, for many receivers, the nearest return location.” The BCG report finds that e-tailers are also “building detailed profiles of buyers through personalized interactions. They can extend those profiles to delivery, and leverage the information into a competitive delivery network.” Then again, experts point out that leveraging big data and creating delivery profiles is not enough to achieve receiver centricity in B2C. To be receiver centric, parcel companies will need to hire consumer-minded talent profiles, track new key performance indicators (e.g. brand advocacy metrics), establish quality-oriented call centres, and build expertise around return on marketing investment.

Orchestrators

The greatest disruption to the delivery networks are orchestrators because they are essentially an interloper in the existing parcel distribution chain. They “efficiently combine assets and services from third-party logistics providers on a user-friendly digital platform in the cloud.” They do not transform the value chain, instead they break it up into individual “rides” executed by third parties. According to the BCG’s paper, orchestrators can “radically deconstruct the current hub-and-spoke networks by constantly adjusting transportation activity and routes to actual volumes.” With time, traditional parcel deliverers could be relegated to commodity suppliers, with few possibilities for differentiation and small profit margins. Even if the scale at which the orchestrators are operating is still relatively small, global integrators cannot underestimate them.

Tech-oriented future

Digital innovations can turn today’s winners into tomorrow’s strugglers. They can erode traditional sources of competitive advantage (or even flip them 180 degrees) and add to competition among existing businesses. Meanwhile, e-tailers and orchestrators increase the number of players in the profit pool while the pool itself remains more or less the same. Labour flexibility, global scale, and receiver centricity will become the sources of a competitive edge. Soon, it will not be enough to simply adopt new technologies. Organizations will need to be overhauled to shed the trappings of operationally-oriented delivery factories that employ a low-skilled workforce and run fixed assets. The future belongs to receiver-oriented innovators, with a focus on information infrastructure and smaller tech-oriented staff. ■



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Pivoting for growth

by **Barbara Babati**, *Product Marketing Manager, Youredi*

In 2015, world seaborne trade surpassed 10bt billion tonnes for the first time in history, according to the United Nations Conference on Trade and Development. The value of global merchandise exports totaled \$15t last year, rising by 32% over the last decade, as per World Trade Organization data. However, McKinsey & Company has also estimated that there is a staggering \$17b of waste in the port and carrier business processes alone. These internal inefficiencies stand in the industry's way of delivering higher profit margins and providing better services to the world economy.

The global maritime shipping sector must prepare itself to compete in the modern data-driven world. Despite the fact that the industry has traditionally been slow to change in general, and to adapt to new technology-driven business models and processes in particular, it simply needs to pivot toward 21st century solutions in order to stay competitive and better satisfy customer expectations.

Getting rid of the ballast

The global maritime shipping industry players are still utilising their aging technology infrastructure, which is one of the key barriers for real-time data exchange. Furthermore, they often use their own tailored systems with proprietary message formats. While the cost and complexity of running these legacy systems are sufficiently high left alone, they're also more and more slowing down the much needed progress of adopting new solutions, hence further fanning the flames of the already aggravated operating and cost inefficiencies. In other words, it's a vicious IT-business cycle.

"The main reason for the challenges and inefficiencies is that the core legacy IT system from decades ago is still in place today," said Jaakko Elovaara, CEO at Youredi, a company specializing in providing the cloud-based Integration and Analytics Platform as a Service (iPaaS) solution, with a particular focus put on global supply chains and logistics. "Making radical changes is perceived as a risky move in the industry, however, cloud-based data integration frees businesses from the burden of owning and operating the required software and hardware that is needed to exchange information efficiently between different applications," he added.

To become a modern business, utilising all available data is crucial. This information has traditionally been located in separate data silos – (over)built multiple times throughout the years for different business applications and purposes, owned by distinctive parties, and developed with the use of various technologies, some of them like chalk and cheese. Now think of multidepartment organizations – such as global shipping companies and their partners, clients, authorities, etc. – that must utilise and update their data across these different systems, a process typically requiring an

extensive amount of manual, error-prone work, updated every so often. "These systems are incapable of real-time data sharing, therefore the coordination between stakeholders and partners is poor. Real-time information sharing adds a layer of visibility and predictability to all processes and operations. It is indispensable for all stakeholders, especially for supply chain partners," Elovaara remarked. He then went on to say, "Additionally, the industry stakeholders use a large variety of different data formats that are not making data sharing less complicated. Data quality is not very good and it's hard to enrich it with old technology."

Electronic Data Interchange (EDI) is the most widely used messaging format in the ocean shipping industry. Dealing with EDI is a burden for the sector, as this format is too restrictive, but most of all because its messages are often full of inadequate or missing data. At many companies, human labour is used to correct the data quality, which by all means does not guarantee having a quality result in the end. "Much of the processes is still based on paper and human intervention. This is slowing down the operations and it is extremely expensive. Processes need to be automated and digitized rapidly and cost-effectively to save time and improve

margins,” Dean Baxter, Senior Vice President, Youredi, commented.

Data and system integration can free the industry from its heavy and in the end risky reliance on EDI. Some of the major issues, such as carrier to terminal coordination, difficulties with terminal operations, coordination across carrier alliances, supply chain visibility, information sharing, and predictability could be easily avoided. Industry participants need to prioritize digital transformation, develop a holistic strategy of achieving the desired (and often also surprising yet positive) effects, find the right technology provider, and attack the problem across all segments of the business.

Focusing on the core business

Technology will have a significant impact on shaping the future of the industry – either because the shipping lines will themselves embrace the e-change, or because new parties will enter the market reshaping it on their own bat. Cloud services, automation, data and system management, and the industrial Internet of Things (IoT) are just a few of the technologies that the key players in the shipping industry must incorporate into their daily operations to stay competitive in the game.

Youredi's iPaaS is widely used in the global shipping industry to execute a digital transformation strategy. The company not only helps to tackle integration challenges while ensuring data protection and security, but also takes cost restraints into account, particularly because the traditional Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT) related transactional and message size-based pricing is getting

outdated by modern flat rate, cheaper models and levels. “Youredi helps some of the biggest stakeholders in the industry, such as steamship liners, startups, shippers, and terminal operators to become more competitive by supporting their digital transformation with a wide range of vital services. Our services help with data management, transfer, transformation, and translation, as well automate processes between partners and systems,” Elovaara explained.

Better data and connectivity management, coupled with real-time information sharing, brings many benefits to all stakeholders in the industry. “Decision-making is most probably improved the most thanks to our technology, followed by increased cost efficiencies and gross margins, greater transparency and visibility incorporated into processes and shipments, and faster end-customer delivery,” Baxter noted.

Youredi has been connecting major industry players' systems and enabling full automation and digitization of their processes. Additionally, Youredi has been validating information about booking requests, transforming the data formats of different information, and transferring this info between relevant stakeholders. Recently, Youredi has also been developing a track and trace solution based on IoT sensors and devices. This equipment can deliver information on shipments through a gateway. This information is central to understanding the status of the goods, which is for example critical in case of perishables, or allows for better planning and optimising vessel loading and unloading.

“Cost-efficient data integration solution and fully-automated digital processes

are vital for the global ocean shipping industry. Youredi can rapidly connect and bring on-board new customers and partners while the customer can focus on their core business. The agility of our solutions helps the global shipping industry to overcome major challenges and inefficiencies,” Baxter summed up.

The tech-race

“Predicting the future is difficult, but we are confident to say that technology will have the power to shape the future of the ocean shipping industry. Those participants of the industry that are navigating their development initiatives right will have a major advantage compared to those that don't start their digitalization journey. The global ocean shipping industry is an important part of the emerging world economy, but its e-infrastructure requires development,” Elovaara underlined. ■

The 2010-founded company, with offices in Helsinki and in Woburn, focuses on cloud-based integration services. Youredi helps its customers to improve information exchange within their businesses and value networks to simplify operations and provide full visibility into supply chain processes. Apart from the Integration Platform as a Service (iPaaS), the company offers a Business Activity Monitoring (BAM) tool for real-time analytics and a Chatbot. For more info please visit www.youredi.com or e-mail/call directly at barbara@youredi.com /+358 407623356.





Photo: www.pexels.com

Born digital

by Dr. Eva Savelsberg, Senior Vice President, and Matthew Wittemeier, Marketing and Sales, INFORM's Logistics Division



Dr. Eva Savelsberg specializes in Agile Optimization Software that renders a wide range of terminal processes more productive, agile, and reliable. Dr. Savelsberg is also a lecturer at the University of Aachen (RWTH), where she received her PhD in Mechanical Engineering in 2002. Dr. Savelsberg has published five books and over 35 papers on innovation in freight transportation.



Matthew Wittemeier brings over 10 years in marketing experience from a breadth of industries, incl. aviation, creative, finance, and software services. He holds a Bachelor in Management and Professional Studies from Southern Cross University in Australia.

“Computers are incredibly fast, accurate, and stupid; humans are incredibly slow, inaccurate, and brilliant; together they are powerful beyond imagination.” This quote, often falsely attributed to Albert Einstein, was made at a time when computers slowly started to find their way into the logistics industry. By modern standards, computer hardware and algorithms of the early 1990s were far from powerful. Back then, if a PC was fed with one of the best algorithms available to try and solve a logistics planning model, one would still be waiting for the result. If the same model was given to a standard PC today, using the latest Linear Programming algorithms (one of the most important classes of optimization techniques), it would take less than a second.

The digital economy is gaining momentum and the shift to data-driven planning in maritime logistics has turned old and familiar practices on their head. With the rise of new technologies, the digital logistics workforce is now using tools and processes based on real-time information and automated decision-making to drive productivity. As an industry, we're now at a tipping point and how we manage this transition is going to define us. But it is not only about how we implement new technologies, but more specifically how we attract a young, millennial-aged workforce that has the new skills needed to drive our digital future.

Formula for failure

As an industry, we've identified the value of digital technology to drive business results. But when it comes to actually putting them into motion, most companies pay lip service to digital transformation. Many believe it is about using shiny new technology to keep doing the same thing. In the worst-case scenarios this

may mean doing the wrong things – just faster. The simple formula: old process + new technology = expensive old process.

Today, many digital transformation projects are focused on the “digital” and not so much on the “transformation”. Instead, the real digital transformation requires change at a much deeper level. It calls for action that cuts across every aspect of how container terminals operate internally and engage externally. This process is less about technology and more about cultural change. It includes elements of understanding how to interpret data and leverage technology so that it shifts every corner of the business, but, equally important, it involves an understanding of how to implement those shifts so that the organization can evolve.

If it isn't broke, don't fix it

Change is often resisted, as is summed up in this adage. It is estimated that only 54% of major change projects are successful. Those that fail are plagued by higher than expected costs and lowered

“ Millennials are quick to adapt to new software and devices. Instead, the focus of the training needs to be shifted to how work is delivered and by whom. It is all about processes, master data management, service level definitions, understanding and using the same KPIs across the organization, etc.

employee morale. Studies also show that when employees see major projects come to nothing or fail to deliver major elements, cynicism sets in, which, in turn, further undermines adoption, utilization, and worse – company culture.

Change management is a well-researched branch of social and business science with many models and techniques that can be implemented. Of the many available, there are some common elements, such as: making the effort to involve every layer of your organization throughout the entire process, working from within your culture to implement change, and continuously assessing and adapting your project to suit the combined technological and cultural needs of your organization.

Only some like it HOT

A common implementation mistake many companies make is to label digital transformation as an IT project only. It is seen as the responsibility of the IT team to take the lead, while the necessary business inputs are provided half-heartedly (or not at all). As a consequence, the project takes a wrong turn at an early stage, and the finished product eventually falls short of expectations.

So, before pinpointing all soft- and hardware vendors on the roadmap to transformation, decision-makers should plan to have two internal stopovers and address the human and organizational aspects of this change process first. The sequence of the so-called HOT approach (Human, Organization, Technology) ensures “transformation readiness” before technology moves in. Many leaders underestimate the consequences of inadequate readiness and, at the same time, overestimate the current capabilities and culture of their own organization. Fully understanding the impact of this process on business and people helps to avoid the pitfalls that so many repeatedly fall into.

Why millennials matter

On the whole, the maritime logistics industry, of which container terminals are a key element, is comprised predominately

of baby boomers with a small proportion of Gen X and Y workers. In short, we have an aging workforce problem. Attracting millennials is as much about attracting skilled workers as it is about attracting young workers – who were born between the early 1980s and early 2000s.

By 2025, millennials will make up three quarters of the global workforce, meaning that the generation of “pen and paper” operators is a dying species. Millennials have grown up with instantaneous communication and “high-tech” is woven into all aspects and areas of their life. Millennials will not only penetrate the logistics workforce in the maritime industry, but they will also drive demand on the customer side. “On-demand” and “digital” is their way of life – anything else will not be accepted.

Talent management

Equipment for the maritime industry must be designed for demanding environments. Similar standards apply to any person working at a container terminal, even if it is just office work. Moreover, many container terminals are located in non-central areas close to the harbour, which are generally far away from the urban centers with their deep talent pools. In the race for talented millennial staff, neither working environment nor location qualifies as a good starting position.

Digital transformation offers organizations the ability to centralize planning and operational support teams. Instead of planning independently at a local level, centralization unlocks synergies across the entire network of terminals, depots, and, of course, organization. Furthermore, a centralized office can be located close to any urban hotspot offering easy access to a high density of top talent. Instead of a remote and foreign environment, a centralized urban office offers a working environment that will not only attract millennials but also allow them to prosper.

Human maintenance

Container terminals face unscheduled downtime due to failing equipment. To mitigate the effect, proper maintenance

and repair procedures are common practice and mostly in place. In order to speed up the ramp-up phase for millennial staff and to smooth out the effects of fluctuation, proper and permanent training schemes need to be in place.

Again, technology is not the central point here. Millennials are quick to adapt to new software and devices. Instead, the focus of the training needs to be shifted to how work is delivered and by whom. It is all about processes, master data management, service level definitions, understanding and using the same KPIs across the organization, etc. Creating a professional, standardized training scheme ensures that new staff receives identical training which can also be optimized over time.

Instead of clinging to aging processes and tools, transformation is needed for container terminal operators to survive and prosper in a digital world. It is not a question of “if” but “when” to start the journey.

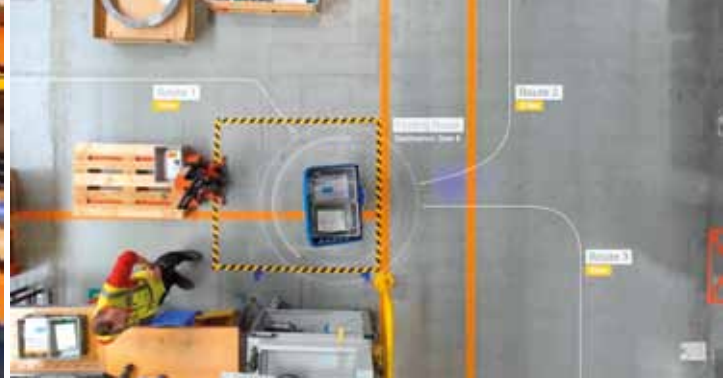
Enjoy the process

Digital transformation is a journey, not a fixed destination. And there is more to observe when taking the digital turn. Terminal operators considering an investment in digital technologies don’t have to change everything overnight. But they should keep in mind that the rate of technological change will never be as slow as it is today. Tomorrow, it will be faster and the pace of change will only continue to increase. ■

INFORM specializes in Agile Optimization to improve operational decision-making in container terminals. Based in Aachen, Germany, the company has been in the optimization business for nearly 50 years and serves a wide span of logistics industries, incl. maritime and intermodal terminals. For enquiries concerning millennials in maritime logistics, please go to www.inform-software.com



Photos: DHL



Of machines and men

by Denis Niezgoda, *Deutsche Post DHL Group*; Anne Träskbäck, *Wärtsilä*; and Joe Lau, *Fetch Robotics*

For many years, robots were considered fascinating elements from science fiction stories. Today, robotic technologies are fast approaching their breakthrough in logistics. Robots will gradually take up collaborative roles in the supply chain, assisting workers with warehouse, transportation, and even last-mile delivery activities. Let's review then the past and present situation of robotics in logistics and take a look at what might happen in the not so distant future.

Have you ever heard of Rossum's Universal Robots? It is the title of a science fiction play written by the Czech writer Karel Čapek in 1921. The play is titled after factory in which the action takes place – a business that manufactures and sells artificial people, the so-called “robots”. Čapek's play is known for introducing the term not only to the English language, but to the whole sci-fi genre.

What may have sounded like fantasy to Čapek's contemporaries does not seem so far-fetched anymore. Industrial robots have been around for decades, but unless you work in a factory, most people have never seen one with their very eyes. However, with the growth of collaborative robots, i.e. machines working alongside people, that's quickly changing.

Already, collaborative robots are everywhere. There are robots mowing our lawns, vacuuming our floors, and entertaining our children. There are robots fulfilling dangerous duties such as removing landmines. There are even specialized care robots looking after the elderly in nursing homes in Japan. And the robotic car, a vehicle capable of driving on its

own, is just around the corner (pun intended). In other words: collaborative robotics is transforming our lives as you read this.

Shoulder to shoulder

Robots have traditionally been developed to provide answers to certain economic demands. It therefore seems inevitable that a great number of industry sectors will become increasingly reliant on advanced robotic technology in the future, among others – logistics. In spite of this, robots did not have a great influence on the world of logistics until recently. So, you may ask, why should this change right now?

The answer is simple. Decision makers in the logistics sector need to find a way to successfully tackle one of today's greatest challenges, namely the availability of labour. As e-commerce is booming and consumers increasingly expect an on-demand economy, there are more and more parcel shipments that need to be moved across the globe. At the same time, the number of the available workforce in the western world is constantly decreasing. The U.S. Bureau of Labor Statistics reports that jobs in logistics are estimated to grow by 26% between 2010 and 2020. On the flip side, however, one global study estimated that the demand for supply chain professionals exceeds supply by a ratio

of 6:1, with some predicting that this ratio could be even as drastic as 9:1.

A way to support the existing staff and increase productivity is therefore desperately needed. In a modern service economy, it is clear some work is easier performed by machines, whereas people skills are better suited for others. Thus, robotics can bring benefits for enhanced safety and efficiency, as well as optimization of processes and operations. Robots are therefore a way of enhancing peoples' capabilities and improving on-site productivity. They enable workers to perform tasks faster and save energy, thus improving overall efficiency.

Robotics in logistics: the time has come

The logistics sector has not participated in innovation and renewal through advanced robotics for a very long time. This is primarily due to the fact that until a couple of years ago, industrial robots have been blind, stationary, and comparatively unintelligent. They were used to perform the same precise movements over and over again, and to never share the same space as a human worker due to e.g. safety reasons. These skills were sufficient for simple duties such as transferring or collecting parts on an assembly line. The complex world of logistics, on the contrary, requires robots with far greater



Photo: Wärtsilä



Photos: DHL

capabilities. They need the ability to handle a wide range of different parts in an unlimited number of combinations. In order to operate effectively and minimize risks for the human workforce, they also would be required to see, move in complex ways, and be aware of their surroundings. Alas, appropriate solutions have either not been affordable or simply not technically feasible – that is, until now.

In recent years, important barriers to developments in robotics, such as lack of research funding, expensive hardware, and limited computing power, have started to disappear. This has led to first steps in the direction of flexible and low-cost automation solutions. Many next-gen robots and automated solutions are intended to facilitate labour processes in logistics hubs through more effective collaboration between people and robots. Unlike their predecessors, these innovations can see, move, and react to their environment, and work with precision tasks alongside the human workforce.

Lastly, according to DHL's trend report *Robotics in Logistics*, around 80% of warehouses currently do not have any supporting automation whatsoever. But soon enough, collaborative robots equipped with high-resolution cameras, pressure sensors, and self-learning capabilities will assist warehouse workers with all manner of tasks. The advantage of these solutions is scalability. Not only can they quickly be moved to different locations everywhere in the world to cover changing peak seasons, they can also be used to conduct replenishment and cleaning activities overnight. Moreover, trailer and container unloading robots will be helping workers with tasks that are physically demanding.

Meet Freight, my new co-worker

Some industry players are currently exploring the opportunities of these exciting technologies. In July 2017, the technology group Wärtsilä and DHL carried out a successful pilot with Autonomous Mobile

Robots (AMRs) in the latter's central distribution centre in Kampen, the Netherlands, where the entire logistics chain of Wärtsilä's spare parts, from order intake to customer delivery, is managed.

The Virtual Conveyor system, developed by the San Jose-based Fetch Robotics, was designed to simplify point-to-point material handling. The robots, called Freight, autonomously transport items from one part of a warehouse to another, saving workers the time as well as wear and tear of that mundane task. The Freight AMRs have a loading capacity of 78 kg and can cover a distance of two meters per second. When the battery life of maximum nine hours comes to an end, the Freights independently return to their charging unit. These robots are also able to recognize their location and surroundings, and can differentiate between dynamic and static obstacles, thus enabling evasive action to work safely with and around people. At Kempen, Fetch robots took over a walking distance of more than 30 km per day.

All parties considered the test a great success, since it demonstrated how quickly and easily smart robotic systems can improve the logistics industry through enhancing people's capabilities and on-site productivity. The partnering companies are currently exploring how automation and robotics can be introduced at other points in the supply chain as well.

In earlier pilots, DHL also tested the Baxter and Sawyer robots from Rethink Robotics in its warehouses on co-packing and value-added tasks such as assembly, kitting, packaging, and pre-retail services.

Embrace the robo-change

The robotic revolution in the logistics industry is real, and it is happening right now. Robots will soon be standard in warehouses around the world. Some are already entering the logistics workforce, supporting zero-defect processes, in effect boosting productivity. Logistics workers will greatly benefit from collaborating with

robotic solutions, while both working speed and service quality for customers will improve.

Tomorrow's market players must therefore keep pace with the evolution of robotics and understand that working with robots means embracing a change that will prepare them for the future. ■

Scan the QR code to see a video on deploying the Freight robots in Wärtsilä's facility in Kampen



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The Helsinki-headquartered Wärtsilä is a global leader in advanced technologies and complete lifecycle solutions for the marine and energy markets. By emphasising sustainable innovation and total efficiency, Wärtsilä maximises the environmental and economic performance of the vessels and power plants of its customers. For more info please click www.wartsila.com



Fetch Robotics, founded in 2014 in San Jose, California, develops



and manufactures collaborative, autonomous mobile robot solutions for the warehousing and intralogistics markets. The company takes advantage of its deep robotics expertise to provide reliable and safe collaborative AMR (Autonomous Mobile Robot) solutions for commercial applications in material handling and data collection. For more info please go to www.fetchrobotics.com



A long road (worth travelling)

by Kim Skaarup, CEO, ShipServ



founded in 1999, ShipServ is the world's largest procurement platform for the marine industry. The company's proposition is simple: it helps marine buyers to find the best suppliers easily, trade efficiently, and build trusted relationships. Buyers speed up their purchasing process and save money. Suppliers serve customers better and find new customers and markets. For more info please visit www.shipserv.com

At a recent European supply chain event for container lines, delegates were told by a pre-eminent container company and a specialist consultancy that digitalisation will create a new era of transparency in the shipping industry. The access to data and end-to-end supply chain visibility is creating real opportunities to reduce and optimise costs, as well as to streamline operations and networks. A picture was painted of a transformed market within a decade, where companies who do not have their processes under control and automated will “not be in business.” In other words, going digital (or not) will be about the “survival of the fittest,” they stated.

Clearly, the advancements and developments that we are seeing in connectivity are creating the foundation to realise this digital revolution. However, shipping is an industry that is traditionally slow to accept change and adopt innovations. There is perhaps a natural reticence, as well as the requirement

for proof and evidence of the tangible benefits that can be gained by investing in new systems and processes. There are also increased reports of cybersecurity attacks – Maersk's terminal arm being the most recent and public victim – which is understandably causing concern and uncertainty in developing a “digital vision”.

The evolutionary pattern

Despite all this, one area of digitalisation where we are seeing progress is within e-procurement. ShipServ launched its e-procurement platform way back in 1999, at the height of the dotcom boom and we've spent the last 18 years building an efficient, reliable, and secure solution (incl. ISO 27001 certification) that works for both shipowners, managers, and suppliers. The platform is free for all suppliers to use, with some premium paid options on the shelf as well. It's fair to say that e-procurement has gained a solid foothold. Serving 200 buyer customers, who are managing 9,000 vessels and trading with 65,000 suppliers, our company's platform has an annual value of trade of \$3.0b.



E-procurement has been adopted because it's relatively easy to implement and the benefits are clear and achievable. We typically see a 30% increase in the procurement team's productivity after moving to the platform. Having said that, there still exists a huge range in attitudes towards, and adoption of, digitisation in procurement.

Here's a typical five-stage digital evolution pattern as we see it. First, there are tactical buyers. They're transactional and reactionary in their focus, using manual processes and little standardisation. This is the least sophisticated group.

Second, there are companies that move from procurement to e-procurement, and with that embracing digitisation and standardisation. They're integrating their systems with ShipServ's or one of the alternative providers.

The third step forward is optimised sourcing. At this stage, shipowners and managers move away from processes dominated by request for quotation (RFQ) and improve their sourcing capabilities, proactively using business intelligence and elements of category management.

They commence benchmarking against other buyers as well.

Fourth, strategic procurement. This category encompasses companies that have mature and heavily embedded category, supplier relationship, and contract management processes. Benchmarking is an integral part of their Key Performance Indicators (KPIs).

And finally, the fifth tier – value chain integrators. These are shipowners and managers that have a truly collaborated and integrated approach with their suppliers, who they have invested in.

Cleaning the data

Many shipowners and managers are at the initial stage of this digital evolution. We speak with them regularly about their concerns about digitising, despite of the benefits. These include disruption of current processes, cost, belief that the IT integration is complex, and simply that there are other business priorities. We understand these worries and work with them to understand and allay their fears.

Conversely, many of the early adopters have been benefiting from digitisation and standardisation for so long they are in transition to the more advanced levels. A key theme in the latter stages is digital data, which enables better monitoring and analytics, which itself enables category management.

Nevertheless, only a very small number of customers with whom we speak with today say they are on top of their data and can use it as they wish. There are many issues with data, like it being "dirty" or the fact that once cleaned it can become dirty again. There is a lack of consistency, too, and much is impossible to be categorised. Some shipowners and managers manually clean their data, incurring additional costs. Particular issues are faced by managers who often have to work with multiple different systems and databases. So, almost all agree that data in the maritime world is a very challenging raw material, making good purchasing decisions challenging.

What can be done? ShipServ has commenced an ambitious spend analytics project to clean and categorise the data, and then show it in new online reporting tools – which we anticipate will be used by all, from purchasing execs to C-level. We have decided to go down this path for two reasons. First, it's consistently the No. 1 issue that senior procurement executives tell us about. Second, with our technology and innovation background, we are well-placed to utilise the latest techniques – including machine learning, algorithms, and Artificial Intelligence – to crack the problem.

Frame of the procurement mind

Having this in-depth and detailed information enables effective category management, which is a way of structuring purchasing. Category management, by all means a hot topic right now, is based on taking a strategic approach to how procurement resources and processes are organised in order to concentrate on specific areas of spend. This enables purchasing and category managers to focus their time, so as to conduct in-depth market analysis. The intelligence that is generated facilitates the improvement of decision-making and allows them to fully leverage their procurement decisions on behalf of the whole organisation. Ultimately, when those responsible for procurement understand more about what they are buying, risk is reduced and product quality improves, as do supplier relationships. Simply put, better business results can be delivered in the end.

It sounds great – so why isn't everybody doing it? To work properly, category management requires several things to come together. These include internal

agreement (alignment across multiple departments of what is required and what needs to change); the right information (accurate and comprehensive data that can be sliced and diced as required); various actions taken by procurement teams to find and realise savings; as well as tracking and reporting to see savings and to ensure compliance with new policies. Often the reporting shows that savings can come from contracting with other suppliers and consolidating spend with fewer suppliers. For instance, one of our solutions, the Supplier Recommendations, enables buyers to benchmark existing suppliers against alternatives.

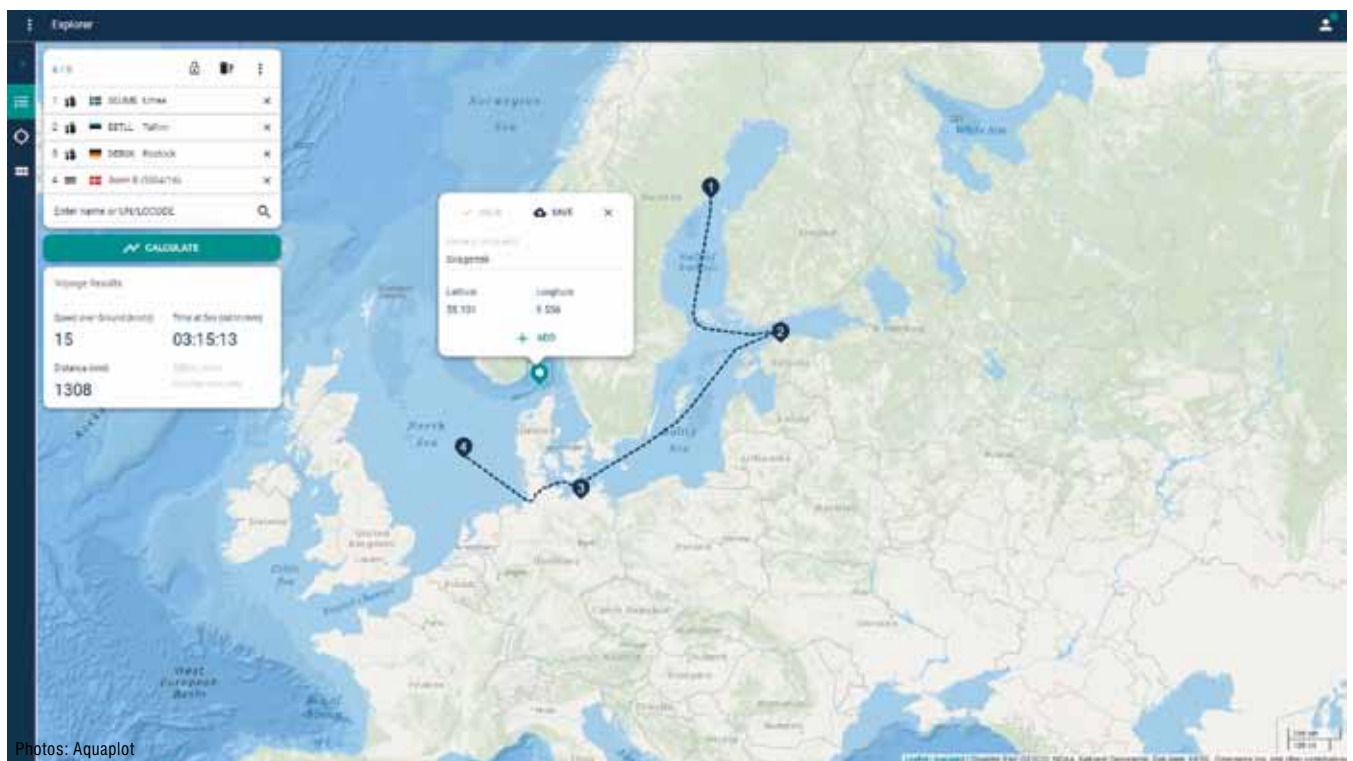
Another key thing to category management is having in-depth discussions with quality suppliers so that buyers get supplier KPI information that they can use during supplier review discussions and negotiations. Many of our customers already have processes and data in this area, and we're aiming to add to this in a new report, titled Supplier Performance Report (available at the end of the year). Apart from providing benchmarks, it will also provide insight into, for instance, payment terms, competitiveness, and the speed of the quote.

Probably the most common series of actions taken by companies embracing category management is a move from highly transactional purchasing (lots of RFQs) to contracts. We know that the contracting process is time-consuming and we will develop a new Contract Module to take some of the pain away.

Going digital is a long road. While shipping may be slow to evolve in digitalisation, significant change is happening in certain areas. E-procurement is an example of this, as it meets the immediate needs and demands of the industry. Clear commercial and operational benefits can be realised in conjunction with the positive development of buyer/supplier relationships. ■

Scan the QR code to visit ShipServ's channel on Vimeo to see the company's videos on e-procurement, as well as related topics, such as the digital transformation, smart suppliers, and other.





Photos: Aquaplot

Through the eye of the storm

by Stephanie Stühler and Kevin Hohmann

Every start-up founder has got his or her own story of why they decided to become an entrepreneur. Most of them became aware of a problem which they wanted to solve in their everyday life or while they were studying a certain topic. The business idea for Aquaplot was developed after a rather dramatic event: Henning Grimm, CEO and Founder of the company, had the initial thought for his own business after he had to weather a storm on the Atlantic Ocean.

On a vessel delivery from the British Virgin Islands to the Azores in 2013, he and his fellow sailors got caught up in a storm because they simply followed the route suggested by the weather routing software used. "Running the programme took forever, so we never really did a comprehensive analysis as to how small changes or slight misjudgements could result in vastly different outcomes," said Grimm when asked about his thoughts at that very serious moment.

The route to improve routing

Back in Germany after his trip, Grimm started thinking about how he could put into practice what was on

his mind. "I was looking for a way to speed up the utilised algorithms, so you would receive results instantly. That would allow the user to run different scenarios and make more robust decisions in a similar situation. After researching approaches used, I was struck by the fact that, even in the commercial sector, this wasn't a solved problem. The techniques were outdated by at least a decade, even though the outcome of these calculations is used for high-value decisions. They are affecting high-stakes investment decisions and operational decisions in the maritime industry every single day," explained Grimm.

This led to a research project at the Karlsruhe Institute of Technology (KIT), where the European Patent pending

technology was developed. The technology was spun-off as Aquaplot and supported by a programme for university-based business start-ups of the German Federal Ministry for Economic Affairs and Energy (BMWi) in 2015. Starting with the basics, the team began to work on an innovative distance calculator for the maritime sector. "The Distance Calculator was the first step on our journey to build a unified routing and analytics platform for the maritime industry. What sets it apart from other solutions is that routes are actually planned and calculated for each request individually in only milliseconds, so effectively we could cover billions of distances from day one," said the young entrepreneur.

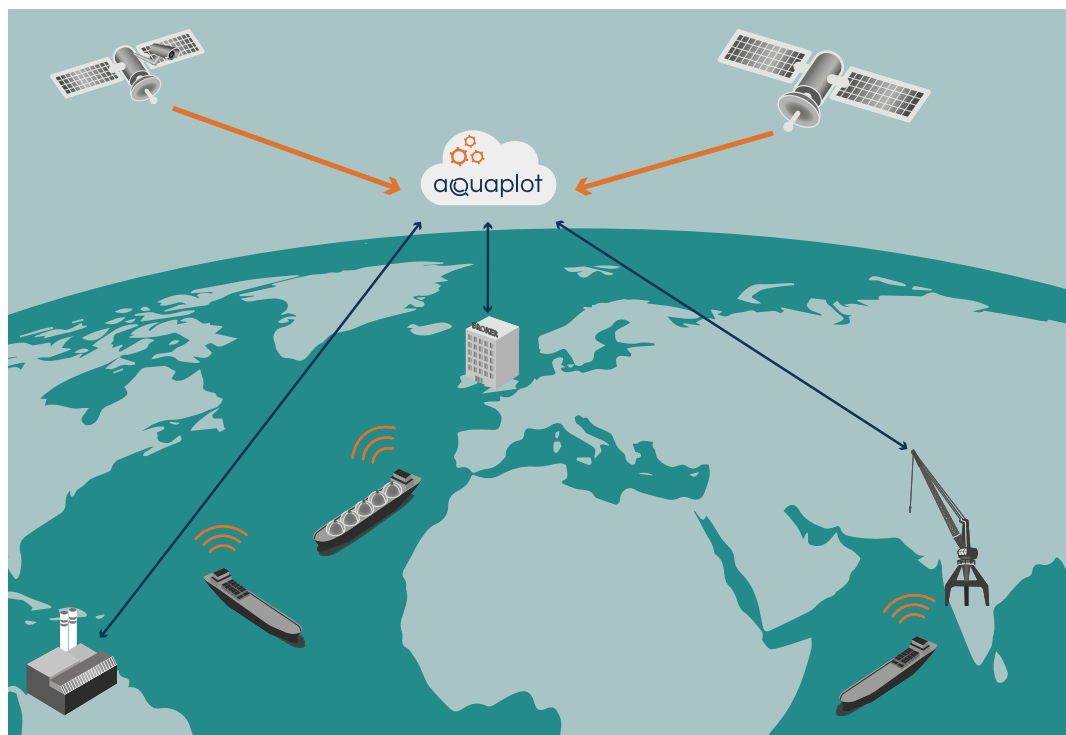
Aquaplot does not use a predefined network of waypoints or historical data,

but instead uses nature-inspired smart software to identify the best route for any given input. "What makes the algorithm special, is that from the start it has been designed in a way that we can incorporate anything from regulatory requirements to custom rules in order to avoid foul weather. That means that at some point in the future, when we have added all relevant information such as weather forecasts or ship models, our system will outperform any human and produce data of the highest quality, at low cost and in real-time," explained Grimm.

Open the source or miss out

Aquaplot has been on the market since mid-2016 and already has over 5,000 registered users from more than 130 countries. "So far, our clients are using the Aquaplot platform for simple voyage estimation, monitoring of ships or business intelligence applications amongst other things," revealed the company's founder.

But the web app is not the end of the line for Aquaplot. Everything that the team develops is accessible via an application programming interface (API), which can be integrated into any product, service, or tool, and it can be done by everyone. And this is one of the most interesting things about the start-up: anybody can get access to the service and build on top of it. Each and every developer can use it to create new prototypes, apps, or services in a fast and high-quality way. "We want to create an ecosystem of open-source software and integrations around the platform," underlined Grimm. "The whole logistics sector should be more open and sharing – or it will miss out on so much innovation that could be happening. That's why we don't put restrictions on how our clients can use our data and we give away as much software as we can via open-sourcing apps and integrations. Even competitors can use components of our software for their own projects."



Hitching the wagon to a star

The second big aim for Aquaplot is to realistically predict the movements of the entire global shipping fleet. This would support its clients in effectively controlling their supply chain or forecasting market effects, for example those occurring due to delivery bottlenecks. To reach this business goal, the start-up is cooperating with the European Space Agency (ESA).

In September 2017, they joined the Technology Transfer Programme of ESA. This incubator programme supports start-ups in the transfer of space technology to the commercial non-space sector. Aquaplot uses satellite position and Earth observation data for making prognoses of fleet movements at sea and for optimising the maritime supply chain. With the support of ESA, the start-up is able to use high-quality satellite data. "The incubator programme supports us in the further development of our platform. Using satellite data, we will be able to take into account dynamic influences, like wind and currents, and can thus offer an even more precise real-time image and a realistic prognosis for our clients," said Grimm.

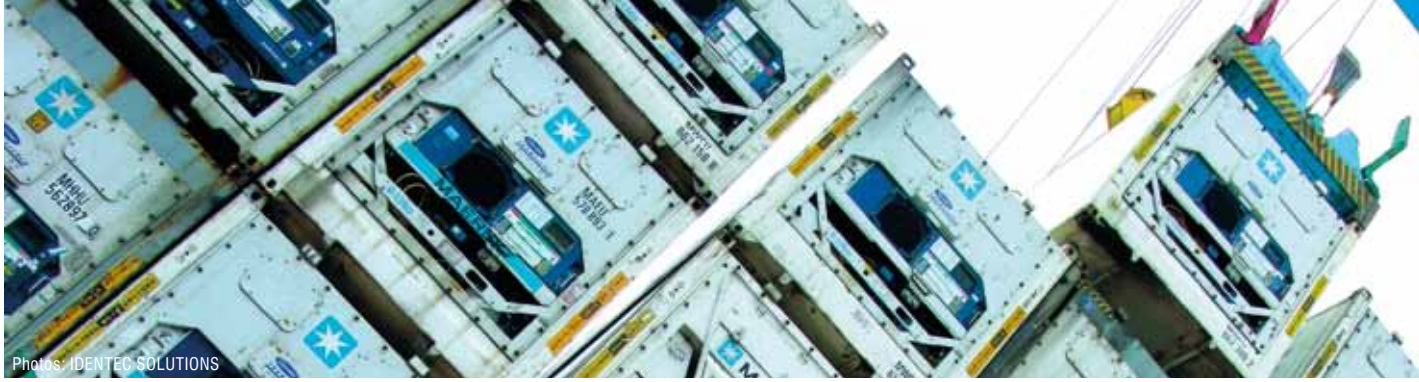
Patching the mindset bug

The third goal for Henning Grimm is to introduce more digitisation to the maritime industry. Surveys conducted among Aquaplot's clients show that about 70% of marine experts and professionals who

have spent a good amount of time in the field think that the shipping industry is not using technologies that are up to date (read also on pgs. 44-48 *Dumb, dark, and disconnected. Addressing waste efficiency in the supply chain with technology*).

"Many experts believe that today's maritime industry is struggling and is not in a very good shape right now," noted Grimm. "And more importantly: a lot of them think that shipping professionals are averse to change and it is very unlikely that the conservative ways of doing business will promise lasting success in the future." That is why the German entrepreneur is trying to accustom the industry to digital services by reducing existing complexity and making things more transparent with his software. ■

aquaplot was founded in 2015 in Karlsruhe. The company develops web-based technologies for maritime route planning. In addition, the start-up supports other innovators in this area with app components, like user interface modules, and offers data and information services via an application programming interface (API). Since September 2017, the start-up has been located at the Centre of Satellite Navigation Hesse in Darmstadt. For more info, please visit www.aquaplot.com



Tagging along after digitalisation

by Andreas Schmitt

When starting its business over 150 years ago, the C. Steinweg Group committed itself to providing the best possible service quality. As we fast forward to present times, an increasing number of valuable goods travelling worldwide inside containers needs to be managed more efficiently. As such, the company has opted for digitising its reefer container management to maintain the proud over century-long legacy of first-rate performance. Consequently, a hi-tech monitoring system, developed by IDENTEC SOLUTIONS, has come online at the Group's multipurpose Süd-West Terminal operating in the Port of Hamburg.

While the digital revolution has already changed how the majority of modern industries operate, among other things, automating a substantial portion of the work, when it comes to container management many processes are still carried out manually. Moreover, there are at least three additional things that distinguish taking care of refrigerated containers from their standard counterparts: connecting/disconnecting them to/from the power supply, as well as carrying out scheduled monitoring. Traditionally, the terminal's staff needs to check the reefers at specific intervals of between four and 12 hours. The checklist includes operation testing and manual recording of temperature, humidity, and various other parameters.

This time-consuming process can be nowadays fully replaced by automated systems, like the CTAS Reefer System from IDENTEC SOLUTIONS. The system, once the container is at the terminal, will assign the upcoming tasks, such as connecting or disconnecting the reefers, to the staff, but maybe more importantly – it will automatically monitor the boxes.

During the whole stay of the container at the terminal, the system will record, notify, and process all the data in real-time in close coordination with the terminal management.

Data automation

Since the end of 2016, every reefer coming to C. Steinweg's facility in Hamburg has been equipped with a wireless monitoring device. This tag is fixed magnetically and produces an automatic link to the container's controller. "We are happy to say that the CTAS Reefer is compatible with all current models of reefer containers from manufacturers such as Daikin, Carrier, Starcool or Thermoking. Unlike the usual power-line modem solutions, this system is completely independent," Stephan Piworus, Global Vice President Sales for Ports & Terminals, IDENTEC SOLUTIONS Germany, noted.

Once connected to the container, the tag constantly and immediately forwards relevant reefer data to the terminal operating system (TOS) by using a radio signal. In case of any discrepancy, an automatic alarm signal is generated, allowing for a



The system, once the container is at the terminal, will assign the upcoming tasks, such as connecting or disconnecting the reefers, to the staff, but maybe more importantly – it will automatically monitor the boxes.



prompt response. Linking the containers to the TOS has enabled the reefers processes to integrate fully into the terminal's operations. While the tag is removed when the container leaves the terminal, the recorded data remain archived and can be later retrieved in the event of enquiries or insurance cases.

"The use of CTAS Reefer facilitates substantially the reduction of labour-intensive manual monitoring as well as the need for documentation," Piworus explained and further added, "Manual data input becomes unnecessary, virtually eliminating any risk of errors in data recording. C. Steinweg not only has a continuous record of the status of any reefer during their stay, but with the cargo being

checked uninterrupted also raises customer satisfaction and safety."

No pain, extra gain

Since the installation of the CTAS Reefer about one year ago, the system has been running steadily without any failure whatsoever. This service improvement has already paid off for C. Steinweg by attracting three new container customers without additional personnel expenses. However, as the company's client base grew, the operations at the Süd-West Terminal had to be tweaked in order to manage smoothly the increasing number of reefers. "We gave special attention to how to organize an optimal service for reefer containers," Rainer Fabian, Managing Director of C. Steinweg (Süd-West Terminal), said. "Automated high-frequency data collection enables us to guarantee maximum safety and security for sensitive reefer cargoes. Instead of going unnoticed, defective reefer aggregates or discontinuation of power supply are quickly reported and can be rectified immediately. Our trained expert staff looks after handling, connection and settings of reefer containers," he added.

The efficiency of the system and the reduction in manual labour have already given a good return within the first year. In the coming months, C. Steinweg is going to expand the CTAS Reefer by adding a new software module for energy monitoring. The add-on will be able to determine the reefers' electricity consumption without the necessity of adding even a single extra device.

CTAS Reefer is the first system of this kind to be installed at the Port of Hamburg. However, because the solution is customisable to fit a business of any size and scale, and thanks to various modules

that can be individually combined, a number of companies across the world have incorporated it to boost their processes. This includes such distinct markets as the Netherlands, the US, Mexico, Dominican Republic, Pakistan, Argentina, Nigeria, Saudi Arabia, and Colombia. Furthermore, CTAS Reefer has been successfully installed on board an inland waterways vessel and was also tested on a container ship during a pilot. ■

IDENTEC SOLUTIONS
AG was founded in Lustenau, Austria, in 1999. Today, the company has additional offices in Australia, the US, Norway, and Germany. Over the years, IDENTEC SOLUTIONS has grown into a global provider of wireless solutions, guaranteeing visibility that in turn improves efficiency as well as safety and security in challenging industrial operating environments. IDENTEC's sector-specific applications, based on robust RFID radio technology, are used in the oil & gas, port/terminal, tunnelling/mining, automotive, and chemical sectors. For more info please visit www.identecsolutions.com



C. Steinweg has been operating its universal cargo handling Süd-West Terminal, located on the Port of Hamburg's Kamerunkai, since 1858. The facility specialises in stevedoring and warehousing (ISPS-certified) services of various general cargo – containerised (incl. refrigerated), metals, coffee, cocoa, paper, and project. Other services provided at the terminal include checking goods, sampling, re-packing, inspections, fumigation, and customs formalities. For more info please go to www.hamburg.steinweg.com

 C. Steinweg (Süd-West Terminal)



A magnetically fixed tag produces an automatic link with the container's controller



Photo: Hanseaticsoft

Simplicity

by Alexander Buchmann, *Managing Director, Hanseaticsoft*



the Hamburg-based Hanseaticsoft offers modern software that helps shipping companies optimise their workflows. The company develops work saving and self-explanatory solutions for customers to cope with infobesity and the increasing challenges they have to face concerning the rapid technological advancement. For more info please visit www.hanseaticsoft.com

These days, shipping companies are not only facing many market challenges – including falling revenues, higher costs, and increased competition – but they also have to find their way through an increasingly regulated environment. In such circumstances, it becomes all the more crucial for ship-owners and operators to anticipate and prepare for any changes that lie ahead.

One new binding legislative piece on the horizon is the EU MRV (Monitoring, Reporting, Verification) regulation, which will come into force on January 1st, 2018. It will apply to all vessels over 5,000 gross tonnage calling at any port of the European Union that load or unload their cargo and/or passengers. To ensure compliance by this date, shipping companies must start preparing a monitoring plan, covering every ship that falls under the regulation, which should have been submitted by 31st August this year. To meet the requirements, companies need to collect and report a range of data, including: origin and destination information, distance travelled, time spent at sea, fuel consumption and carbon emissions, as well as transport work and details of the cargo carried. The data will be published by the European Commission by June 30th, 2019, and every consecutive year afterwards. The enforcement process for MRV is going to be left up to EU Member States. For instance, under the UK rules a company could be made criminally liable for non-compliance.

It is estimated that relevant ships account for 55% of all ships calling into EU ports and 90% of related emissions. Quantifying ship-related CO₂ emissions

will form a base for creating future policies aimed at bringing the shipping industry within range of the EU's environmental policy (e.g. by introducing a new benchmarking system which will incentivise ordering more eco-friendly units, or upgrading existing ones).

While it's imperative that shipping companies which fall under the MRV rules start preparing for the new requirements as soon as possible, even ship-owners and operators not currently trading in Europe may want to consider introducing a compliance process in advance, to ensure they can compete for EU-based maritime business in the future.

A cloud on the horizon? Thank heavens!

The good news is that technology already exists that can help shipping companies with complying with the EU MRV, and do it easily and with minimal effort. For example, we recently launched our Cloud MRV module within our Cloud Fleet Management (CFM), a solution that simplifies the capturing, monitoring, and reporting process by offering a single app into which data can be entered from the ship. The data is then aggregated, synchronised, and managed within a single system, and can be transmitted quickly, seamlessly,

“As the data is stored in the cloud, Internet access is all that is required to inspect data from all vessels anytime and anywhere. Data is transmitted from the vessels easily and can be accessed immediately by relevant parties, who can inspect reports about the entire fleet using a web browser.”

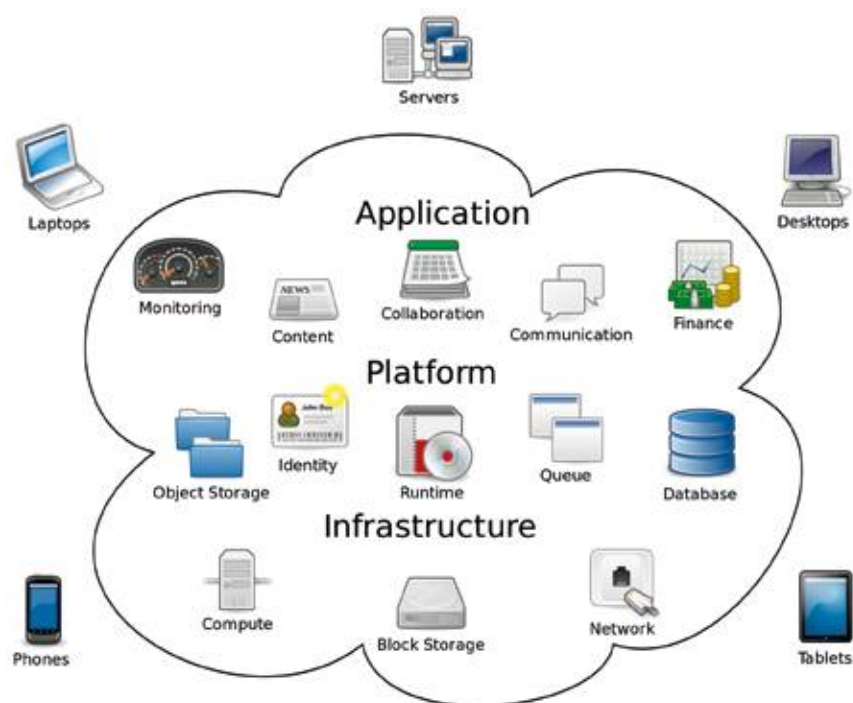


Photo: Wikimedia Commons

Cloud computing

and securely to relevant parties, including to a member of the International Association of Classification Societies (IACS) who has been approved as a MRV data verifier.

Using the Cloud Ship Manager (CSM), an application for use at sea, all data can be captured offline and synchronised with the cloud as soon as an Internet connection is available. As the data is stored in the cloud, Internet access is all that is required to inspect data from all vessels anytime and anywhere. Data is transmitted from the vessels easily and can be accessed immediately

by relevant parties, who can inspect reports about the entire fleet using a web browser. In other words, shipping companies don't have to install any new software in their offices.

As with our other applications, we have placed great emphasis on intuitive usability and clarity when designing the Cloud MRV module. The user interface on-board is reduced to the most relevant elements, and enables the crew to work directly in a productive way. Moreover, no special training is necessary to either start or master using the Cloud MRV (or CFM in general).

Companies wanting to monitor and sustainably improve the overall performance of their fleet also have the option to upgrade to the full-featured Cloud Event Reporting within the CFM platform. This gives access to a number of additional key figures, such as times of anchorage and docking, as well as machine-related data or bunker analyses. Taking advantage of these features, in tandem with implementing the necessary EU MRV compliance measures, could be the first step towards real performance management that goes beyond the minimum set by the legislation.

Difficult things made simple

Cloud MRV is making compliance straightforward, painless, and cost-effective, enabling companies to easily meet the new regulation in time. In the end, the core benefit is simplicity. All data is stored in the cloud, so all that is really needed to access the data from all the vessels is an Internet connection.

Now, imagine the EU proposing a similar regulation 20 or 15 years ago, when the Internet was nothing more but a shrapnel burst of pixels available to a handful of lucky ones, while the word “cloud” denoted a mass of minute liquid droplets floating up in the skies and stimulating the imagination of daydreamers and meteorologists. Back then, the EU MRV would be a nightmare. Today, thanks to digitisation, it's a completely different story. ■



Power of the future?

by Dr. Daniel A. Kaute and Dr. Gleb Ivanov, *Silicon Fuel Ltd.*

Since the signing of the Paris Agreement in December 2015, nearly all the nations of this world (with the notable exceptions of the USA and Syria) have been in agreement over the grave threat posed to our planet by global warming. Corporate social responsibility dictates that each and every industry take steps towards saving our planet – and this naturally also includes the sea shipping business.

Having been by and large spared until now, the shipping industry is currently coming under increasing pressure to make a contribution to the joint efforts to alleviate pollution and global warming. Only recently were the sulphur, nitrogen, and CO₂ limits set on a timetable to become much more stringent.

One issue deserves particular attention here; namely, the type of fuel used to power seaborne trade. For the time being, it seems that we're hopelessly dependent upon fossil-based bunkers. However, there are technologically advanced projects aimed at developing truly carbon-neutral solutions.

Is there really a choice?

This mounting pressure has prompted the industry to scramble for viable alternative solutions. Currently, there are a few methods – more or less widely adopted, or still under development – of making one's operations greener.

First, we have scrubbers, a solution that essentially boils down to cleaning up after the actual polluting has taken place. This approach uses the fairly cheap Heavy Fuel Oil (HFO), retrieving the hefty sulphur emissions after the burning process has finished. Spending time

and effort to clean up pollution which you have created a moment ago, is not a sound engineering approach and it does not follow the spirit of sustainability. Just as with sustainable waste policy, the best approach is to avoid or reduce emissions in the first place.

Second, we have clean diesel. Using this kind of fuel with current engines reduces sulphur emissions to the required levels, but comes at a significant cost increase of about \$200 per tonne vs. HFO prices. What's more important here, though, is the fact that carbon emissions stay roughly unchanged.

Third comes Liquefied Natural Gas (LNG). This bunker type is much cleaner than HFO and diesel, with significant reduction of both SO_x and NO_x – but not CO₂. Outfitting vessels with high pressure storage tanks also carries a substantial cost. While there have been a few examples of retrofitting ships to utilise gas as fuel, LNG is presumably still most financially feasible in newbuilds, thus reducing the effect to an incremental one, as new ships are introduced to the fleet.

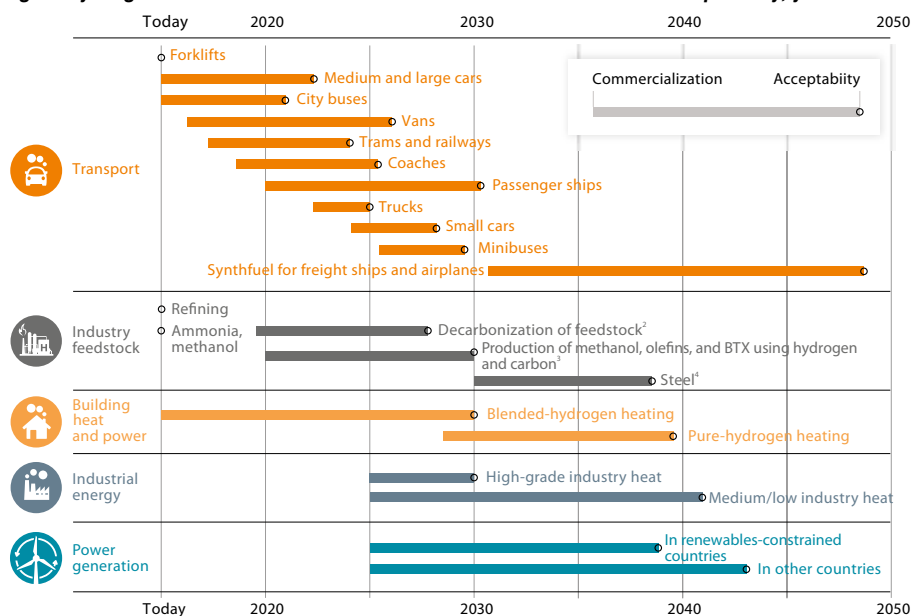
Additionally, it is not applicable to all types of ships (e.g. fishing vessels), and is not currently available worldwide due to the complexity of the bunkering systems



After oxygen, silicon is the second most abundant element on our planet (read: it's cheap). SF requires low storage volume comparable to that of diesel (within a factor of 2.0) and is comparable when it comes to costs (when fully optimised in mass production).

Hydrogen as ship fuel – zero emissions, no carbon footprint, competitive price

Fig. 1. Hydrogen use from initial commercialization to mass-market acceptability, years



¹ Defined as sales >1% within segment in priority markets

² Market share refers to the amount of feedstock that is produced from low-carbon sources

³ BTX refers to benzene, toluene, and xylene. Market share refers to the amount of production that uses hydrogen and captured carbon to replace feedstock

⁴ Direct-reduced iron with green hydrogen, iron reduction in blast furnaces, and other low-carbon steelmaking processes using hydrogen

Source: McKinsey Center for Future Mobility's Hydrogen: The Next Wave for Electric Vehicles?

required. If released, methane emissions from LNG are 20 times more potent than CO₂ regarding the greenhouse effect.

Fourth, there is Synthetic Liquid Fuel (SLF). Being carbon "neutral", it's an alternative to hydrogen. However, SFL is at

an early stage of development and it's expensive to produce, too. The typical production process entails capturing carbon, transporting it, transforming it back into a carbon-based fuel using renewable energy, and then transporting it back to the point of distribution. When used in transportation, CO₂ is released back into the atmosphere.

And finally the fifth option – hydrogen. It's by far the cleanest option with zero emissions (SO_x, NO_x) and carbon neutral under certain conditions. At the same time, however, it's expensive to produce, as well as difficult and costly to store. Hence, it is currently not considered viable.

Getting real about hydrogen

Over 95% of hydrogen is produced using a process called steam methane reforming (SMR). In short, it's about transforming natural gas into hydrogen, while producing CO₂. Although it may be zero emission at the point of use, the actual carbon footprint is 9.0 kg of carbon dioxide equivalent per 1.0 kg of H₂. The produced hydrogen is then used in a fuel cell at 50% efficiency, leading to emissions of 540 g



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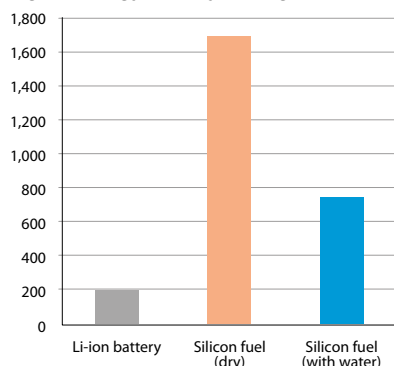


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Fig. 2. Energy density, Wh/kg



Source: Silicon Fuel Ltd.

CO₂/kWh. This ratio is about the same as the amount of CO₂/kWh emitted if natural gas is used. Thus, SMR-produced H₂ is as clean as LNG – but not cleaner.

Alternatively, hydrogen can be produced at the point of distribution via electrolysis (typically at a refuelling station, e.g. in a port). This is more costly than SMR, mainly due to the price of electricity, though much less complex in logistics. The carbon footprint depends on the ratio of electricity derived from coal versus renewables. What's also very important in this context is that the already overloaded electrical grids would need significant extra capacity to cope with this additional demand for electrolysis (the use of hydrogen for electricity production requires roughly triple the amount of electric energy used by batteries – it only has a third of the round trip efficiency). Nevertheless, relying exclusively on renewables to produce the needed electricity would make this hydrogen source close to having a zero carbon footprint.

Silicon Fuel Ltd., set up in Oxford, UK, is a spin-out from the University of Oxford Chemistry Department. The company has been established to further develop and commercialise its invention, a unique silicon-based nanomaterial that generates hydrogen via a reaction with water and can be used for powering i.a. vessels. For more info, please visit www.siliconfuel.com



Although this may be a long-term solution, in the short run it's implausible. Renewables are, in most cases, still sporadic sources of energy. Solar energy requires large surface areas and good daylight, while wind energy requires strong and reliable airstreams – something that does not exist in many urban areas. We also have to wait a bit longer for large-capacity battery packs to penetrate the market, so that excess energy from renewables, produced when the demand is lower than supply, could be stored for future use. Additionally, the intermittent use of the electrolysis equipment, with its relatively high capital cost, would drive up the expenses if amortization is calculated over a fixed period of time.

Why "Solid State"?

Solid State hydrogen (SSH), as the name implies, is a solid which can produce hydrogen under specific conditions, enabling easy and clean production of electricity virtually anywhere. Its main advantage is that it can be easily and safely transported and stored. Our company, a recent spin-out from the University of Oxford Chemistry Department, has a simple and elegant – though not immediately obvious – solution for the creation of SSH using silicon, with the potential cost on par with the current cost of diesel.

The chemistry behind this proprietary innovation is very simple: silicon, in its activated form – Silicon Fuel (SF), reacts with water and produces hydrogen gas, along with silica (i.e. sand) as a by-product. Either sea or fresh water can be used for this reaction. After oxygen, silicon is the second most abundant element on our planet (read: it's cheap). SF requires low storage volume comparable to that of diesel (within a factor of 2.0) and is comparable when it comes to costs (when fully optimised in mass production).

While many other manufacturing methods for solid state hydrogen have been suggested, most involve complex processes and higher expenses. Hydrogen produced via SF is potentially the simplest, most straightforward, and cost-effective process.

Handy

Silicon Fuel (in pellet form) can be produced wherever there is abundant renewable electricity that comes at a zero carbon footprint. Hydro power, for instance – clean, inexpensive, and available 24/7 – would be a perfect match. SF is packaged in sealed containers under controlled atmosphere (akin to modified atmosphere packaging for fresh produce, like meat or cheese) and then distributed to harbours worldwide with a shipping partner. It is loaded onto shipping vessels using standard shipping containers, and the hydrogen is released as required, using fresh or salt water. About 1.4 m³ of SF produces one MWh of electricity. The waste material is collected in the same containers used for the original fuel and returned for eco-friendly recycling to the point of production. This is actually what makes it zero carbon footprint from start to finish (assuming distribution via hydrogen-fuelled ships).

As with any innovation, it is important to fully evaluate a given technology before using it for mission-critical applications, such as the main propulsion system of a ship. Points of entry for this technology could follow this sequence. First, co-injection of hydrogen with diesel to reduce emissions. Next, delivering clean on-board electrical power for keeping harbours clean while the vessel is berthed in a port. Lastly, replacing fossil fuel for driving the ship's power train (through adapted engines or by adopting the fuel cell technology).

The solution?

Silicon Fuel meets the fuel requirements of long-range deep-water ships, but can serve short sea shipping as well. It is easy to distribute and store, simple to refill, can utilise sea and fresh water, and has the potential to be price competitive. What's more, it can also make our harbours and seaways much cleaner.

With the right technology, hydrogen is truly capable of delivering a clean, cost-effective, and sustainable energy solution for the shipping industry. As with any new technology, success strongly depends on commercial partners and early adopters with a vision for a better future. ■

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Uncertainty should not encourage inactivity

by Peregrine Storrs-Fox, *Risk Management Director, TT Club*

It seems each day that passes brings further uncertainty for those operating in the freight market between UK and Europe. Despite Brexit being clearly on the horizon, its implications for freight transport seemingly are becoming ever more clouded. This uncertainty is, however, no excuse for inactivity, as many in the UK's road haulage, shipping, forwarding, and logistics sectors have already proven. Here are a few key issues faced by transport operators as they plan for the Big Leave.

Inevitably, there are many unanswered questions regarding the future shape of UK-European supply chains, as well as uncertain forecasts over Brexit's effect on cargo volumes through UK ports. Then again, there may be reasons for UK exporters and transport operators to be optimistic: potential new trade agreements with non-EU countries, favourable currency exchange, and possible tax breaks encouraging foreign manufacturers to use the UK as their European supply hub.

Frictionless borders

However, these "unknown unknowns" must remain as opportunities to be carefully monitored, while there are sufficient "known unknowns" to be considered and where possible shaped by freight industry players lobbying and advising UK Government negotiators. Concerns have to include a potential exit from the European Union Customs Union (EUCU), with its threat of tariff and duty imposition, border checks translating to delays, additional customs declarations, and all

the associated bureaucracy. Such matters could profoundly challenge all involved in both inbound and outbound supply chains featuring EU and UK elements.

A recent estimate by the Food Storage and Distribution Federation (FSDF) puts the number of additional customs declarations (chiefly for import cargo) in the order of 300m. Of course, the supply chains for chilled and frozen foodstuffs would be affected by delay and unnecessary storage. The UK Warehouse Association (UKWA) puts a figure of £5.0b in extra costs brought about by the additional administration before any potential duty is applied.

Government consultation with industry associations such as the Freight Transport Association (FTA), port representatives, and transport operators themselves has been taking place ever since Brexit became a reality. HM Revenue & Customs (HMRC) in particular have been very active in garnering industry opinion and advice on the possibilities of increased workload and aspirations for "frictionless borders," whatever the outcome of Brexit negotiations. Many have significant concerns over the HMRC's ability to handle the flood of declarations electronically.

A recent Financial Times report stated that the new Customs Declaration System (CDS), which was already being developed before the Brexit referendum, "had fallen into the category of programmes needing 'urgent action' in order to be ready by March 2019, and that the chair of the parliamentary inquiry into the matter said confidence in the system being operational in time 'had collapsed'."

There is clearly a need for cooperation between all industry stakeholders and Government, including both political and bureaucratic agencies. The message to TT Club Members, and the wider freight and logistics community, is to engage with trade association and other industry representatives in order to seize the critical opportunity to help shape the outcomes of Brexit, as well as the future of the UK's freight and trade environment.

Post-Brexit port volumes

The proportion of UK exports represented by EU destinations was 47% in February 2017. This level has varied over the past two years, ranging from 38% to 51%. Imports from the EU represented 54% of the UK total in February 2017, with a range over a similar period between



Photo: Wikimedia Commons



Photo: Port of Felixstowe

46% and 56%. Although the variations are quite marked, it is also pretty clear that about half of UK trade in both directions is with the EU.

While those freight operators more chiefly involved in deep-sea trades, as well as container shipping lines and many freight forwarders, may feel they will be little affected by Brexit, there are unknowns regarding the volumes of trade that the UK can expect post-Brexit. Arguably, trade to/from other parts of the world might increase, perhaps requiring more deep-sea servicing. Conversely, changing trade flows between the UK and the Continent might result in fewer port calls by deep-sea lines. Will the feeder option from the Continent become more economically preferable? Much may depend on the nature of the customs access; feeder movements need to benefit from ease of process. Again such “known unknowns” need to be assessed and monitored as the terms of a Brexit arrangement become clearer in the months ahead.

Some of these unknowns will play a part in the future shape of the UK’s port business landscape. Some will face more complex challenges than others, with greatest impact possibly on the cross-Channel and North Sea ferry ports. Indeed, the combined truckloads transiting Dover and Eurotunnel amount to around 15k per day currently, and alterations to this volume would have a significant effect both commercially and operationally. Here the hope of a frictionless border is most ardently held as both the port and the tunnel have nowhere near sufficient staging area for trucks awaiting customs clearance,

which could easily take a minimum of two to three hours.

In common with others in the port community, Dover urges that solutions to post-Brexit border congestion must be brought forward by industry stakeholders since Government officials lack knowledge and experience of the complex logistics situation to formulate solutions themselves. Once more, proactive collaboration by all parties is the key to a successful outcome.

Risk-based supply chain re-engineering

Another aspect to the challenging negotiations yet to start in earnest between the UK and EU is that of limited timeframe. UK political considerations, exacerbated by the minority Government that resulted from the recent general election, are in danger of shortening what is already a tight deadline (March 2019) by which the terms of Brexit are to be decided. Many in the UK freight industry consider the timeframe much too short for the customs system to be digitalized sufficiently to achieve a 100% paperless entry process and therefore for physical delays at the border to be avoided. This is, of course, assuming UK’s exit from the EUCU is part of Brexit.

Other considerations in achieving a frictionless border include renewal of the Le Touquet border treaty which currently positions the French border in Dover and Folkestone (for the Eurotunnel), and the UK border in Calais. The special case of the Irish border will also need resolution, regarding both the land border with Northern Ireland and the use of the UK as a land bridge for Irish trade with the Continent.

But it is transport operators and logistics companies remain likely to see the greatest potential change to their business models. The re-establishment of a UK customs border with the EU will necessitate significant re-engineering of EU-UK supply chains in many cases. Risk-based decisions will likely have to be taken well before it is clear what the future landscape will look like, so supply chains can adapt quickly and seamlessly at the point change comes. On a positive note, UK contract logistics, warehousing, and distribution services could see increased demand, as UK stockholdings within pan-European distribution centres on the Continent are brought back to the local UK market in order to serve UK customers without fear of clearance and lead time delays.

In conclusion, whilst Europe as whole, including the EU, will surely continue to be a highly important trading partner for the UK, there should also be more focus on overseas markets. This might well create as much opportunity as threat in air and sea freight as part of an overall provision of UK, European, and global supply chain services. ■

TT Club specialises in the insurance of intermodal operators, non vessel owning common carriers, freight forwarders, logistics operators, marine terminals, stevedores, port authorities and ship operators. The company also deals with claims, underwriting, risk management as well as actively works on increasing safety through the transport & logistics field. For more info please visit www.ttclub.com

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Photos: www.pexels.com

International trade sanctions

by **Daniel Martin**, *Partner, HFW*

Ten years ago, international trade sanctions was a niche area, of limited interest to the great majority of commercial organisations. Fast forward to today, and they have become a board-level issue for almost every company engaged in international commerce, because of the number of countries targeted by sanctions, the breadth of the restrictions and the consequences if they are breached. We have seen a number of high-profile enforcement actions over the past few years, with fines running into millions and billions of US dollars.



Daniel Martin advises ship-owners, operators, freight forwarders, insurers and brokers on regulatory and compliance issues, including the impact of international trade sanctions, export controls, customs and anti-corruption legislation. Daniel advises on all aspects of the EU and UK sanctions legislation, and is also familiar with the application of US sanctions to non-US persons. He regularly receives instructions to advise on compliance procedures and controls to adopt to minimise risk.

Given the progress with respect to Iran, where sanctions have been seen as a key factor in bringing about an agreement to resolve the issues surrounding Iran's nuclear programme, the use of sanctions as a diplomatic tool is expected to continue, with new sanctions likely to be imposed in response to other diplomatic issues. It is also anticipated that there will be increased enforcement of the sanctions that are in place.

Basis for international trade sanctions

Trade sanctions are commonly imposed by a multitude of authorities, including the United Nations, the European Union and national governments (including the United States, Switzerland, Australia and Canada).

The UN Charter gives the Security Council "primary responsibility for the maintenance of international peace and security" and requires UN members to "accept and carry out the decisions of the Security Council in accordance with the Charter". Article 41 gives the Security Council authority to impose measures including "complete or partial interruption of economic relations".

The EU adopts sanctions and other restrictive measures pursuant to Common Foreign and Security Policy and, in particular, Article 25 of the Treaty on the

European Union and Article 215 of the Treaty on the Functioning of the European Union. National legislation sets the penalties for breaching sanctions and, in the case of the United Kingdom, can include up to two years' imprisonment and unlimited fines. As a result of the UK Crime and Policing Act, these penalties are increased to up to seven years' imprisonment, and there is also scope for civil monetary penalties (of up to £1m or 50% of the estimated value of the funds that breach the sanctions) to be imposed. Deferred prosecution agreements will also be available in respect of sanctions breaches. On March 31st, 2016, the UK's Office of Financial Sanctions Implementation (OFSI) was established. OFSI has a two-pronged mandate: to help ensure that financial sanctions are properly understood, but also to ensure that the sanctions are properly implemented and enforced.

Extent and the scope of application of international trade sanctions

As of April 2017, there are EU restrictions in place against companies and individuals in or connected with more than 20 countries (including Belarus, Libya and North Korea). The restrictions that are likely to have most impact on businesses engaged in shipping and international commerce are those restrictions



imposed pursuant to the sanctions relating to Iran, Syria and Ukraine (including measures affecting trade with Russia). In January 2016, in a hugely significant development, a large number of the restrictions affecting Iran were suspended, pursuant to the Joint Comprehensive Plan of Action (JCPOA). The JCPOA, commonly referred to as the Iran Deal, was the culmination of many months of negotiation between Iran on the one hand and the P5+1 on the other (i.e. UN Security Council's five permanent members: China, France, Russia, the United Kingdom, and the United States, plus Germany).

UN sanctions do not apply directly to companies or individuals, whereas EU sanctions have direct effect on EU companies and individuals, as well as applying to any legal person, entity or body in respect of any business done in whole or in part within the EU.

US sanctions can be split into two broad categories, namely domestic measures that apply to all US nationals and entities (including banks in US whose only role in a transaction is to clear US dollar payments) and measures that seek to have extraterritorial effect, by empowering US agencies to impose penalties against non-US companies, such as complete exclusion from the US banking system.

Nature of restrictions

Virtually every sanctions programme includes an asset freeze, the effects of which are twofold: first, the funds and economic resources of the designated

individuals and entities are frozen, meaning that they cannot deal with their own assets; second, it is prohibited to make funds and economic resources available, directly or indirectly to or for the benefit of the designated individuals and entities. The US refers to the designated individuals and entities as Specially Designated Nationals (SDNs), and publishes the SDN List of designated individuals and entities.

The designated entities frequently include politicians (e.g. government ministers) and members of the military and intelligence services, but they may also include prominent businessmen who are supporting the regime via their business activities, and also the spouses and children of high-ranking politicians. For example, under the Libya sanctions the EU designated not only Muammar Gaddafi, but also his daughter and several sons, and there are businessmen designated under the Syria and Ukraine-related sanctions.

Funds and economic resources are defined very broadly in the sanctions legislation (e.g. in Article 1 of Regulation 267/2012 relating to Iran) and will include virtually any asset that has any economic value. In particular, "funds" include not only cash, cheques and deposits at banks, but also performance bonds, letters of credit and bills of lading. "Economic resources" means assets of every kind, whether tangible or intangible, moveable or immovable, which are not funds, but which may be used to obtain funds, goods or services.

In addition, many of the programmes include bans on the trade in specific items. Some bans are common to many programmes (such as the prohibition on the supply to the sanctioned country of military and dual-use equipment, as well as equipment for internal repression), but other bans are specific to the sanctions programme and demonstrate a more targeted approach. By way of example, as of



This article was first published in *The Shipping Law Review* – Edition 4. Scan the QR code to see the whole publication.





April 1st, 2017, it is prohibited to sell, supply, transfer or export to Syria identified equipment, technology or software that may be used for the monitoring or interception of Internet or telephone communications. Likewise, licences are required for the sale, supply, transfer or export to Russia of listed oil and gas equipment, and no licences may be granted in respect of new contracts for supply to Russian Arctic, deep water or shale projects, other than in the event of an emergency.

Sanctions imposed against North Korea in April and May 2016 in response to the nuclear test conducted by North Korea on January 6th, 2016, and the rocket launch conducted on February 7th, 2016, specifically targeted shipping. In particular, they restricted the provision of vessels and crew to North Korea, restricted access by Korean vessels to EU ports and restricted the supply of insurance, vessel registration and vessel classification services to North Korean vessels.

Finally, the sanctions against Syria include wide-ranging restrictions on the availability of finance and insurance, and the sanctions relating to Ukraine include restrictions on certain Russian entities' access to debt, equity and capital markets, as well as new loans and credit. These latter restrictions, commonly referred to as "sectoral sanctions" require businesses to conduct due diligence not only on their counterparties (to see whether they are included on the list of entities that are subject to sectoral sanctions) but also on the specific

transaction (to see whether it includes any prohibited activities).

Enforcement of sanctions

As of April 1st, 2016, the majority of high-profile international sanctions enforcement has been by US authorities and particularly the Office of Foreign Asset Controls (OFAC) within the US Treasury. Notable examples include fines imposed or penalties agreed with a host of international banks, including BNP Paribas, HSBC, Commerzbank, ING, Credit Suisse and Barclays. In addition, penalties were imposed against businesses involved in shipping and international trade, including PDVSA, the American P&I Club and Dr Cambis/Impire Shipping.

The enforcement actions against banks generally relate to their involvement in processing payments in breach of US sanctions against the likes of Iran, Sudan and Cuba. By way of example, according to the settlement agreement that Commerzbank reached with OFAC in March 2015 and pursuant to which Commerzbank agreed to pay \$259m to OFAC to settle its potential civil liability for apparent violations of US sanctions regulations, the bank processed thousands of transactions through US financial institutions that involved countries, entities, or individuals subject to the sanctions programmes administered by OFAC, the bank engaged in payment practices that removed, omitted, obscured, or otherwise failed to include references to US-sanctioned persons in SWIFT payment messages sent to US financial institutions and bank employees deleted or omitted references to Iranian financial institutions, replaced the originating bank information with Commerzbank's name, and later created a process to route payments involving Iranian counterparties

to a payment queue requiring manual processing by bank employees rather than routine, automated processing.

In June 2014, BNP Paribas entered into a plea agreement with the US Department of Justice, pursuant to which BNP Paribas agreed to pay total financial penalties of \$8.9736b, including forfeiture of \$8.8336b and a fine of \$140m. As part of the plea agreement BNP Paribas acknowledged that, from at least 2004 until 2012, it knowingly and wilfully moved over \$8.8b through the US financial system on behalf of Sudanese, Iranian and Cuban sanctioned entities, in violation of US economic sanctions. The conduct also led to penalties being imposed by other US regulators, including the New York State Department of Financial Services, which announced at the time that BNP Paribas had agreed to, among other things, terminate or separate from the bank 13 employees, including the Group Chief Operating Officer and other senior executives and suspend US dollar clearing operations through its New York branch and other affiliates for one year for business lines on which the misconduct centred.

PDVSA was penalised for supplying two cargoes of reformat to Iran between December 2010 and March 2011. The penalties imposed on PDVSA prohibited the company from competing for US government procurement contracts, from securing financing from the Export-Import Bank of the United States, and from obtaining US export licences. These penalties did not apply to PDVSA subsidiaries and did not prohibit the export of crude oil to the US by PDVSA.

The American P&I Club agreed to pay US authorities around \$350,000 in May 2013 to settle potential liability for 55 apparent violations of US sanctions against

Cuba, Sudan and Iran. The violations related to settling P&I claims and providing security by way of letters of undertaking and letters of indemnity. The penalty could have been as high as \$1.7m, but was reduced because of various mitigating factors.

Dr Dimitri Cambis was added to the SDN List in March 2013 on the basis that he helped the National Iranian Tanker Company (NITC) obtain eight tankers in late 2012 in a manner that concealed the Iranian origin of crude oil by obscuring or concealing the ownership, operation, or control of the vessels by NITC. While the vessels were purchased and seemingly controlled by Dr Cambis and his company Impire Shipping, they were in fact said to be operated on behalf of NITC, which at the time was on the US SDN List.

On March 31st, 2016, the UK's Office of Financial Sanctions Implementation (OFSI) was established. Part of OFSI's mandate is to ensure that the sanctions are properly implemented and enforced. The March 2015 Budget referred to the government's intention to create OFSI and included the following indication of the direction this might take: the government will review the structures within HM Treasury for the implementation of financial sanctions and its work with the law enforcement community to ensure these sanctions are fully enforced, with significant penalties for those who circumvent them. This review will take into account lessons from structures in other countries, including the US Treasury Office of Foreign Assets Control. The Policing and Crime Act 2017 (which received Royal Assent on January 1st, 2017) includes, at Section 146 onwards, new powers for HM Treasury to impose monetary penalties for sanctions breaches. The penalties can be up to GBP 1.0 million or, where the relevant offence involves a breach of the asset freeze, up to 50% of the value of the relevant funds or economic resources. Rather than having to satisfy the criminal burden of proof (beyond reasonable doubt), HM Treasury will only need to satisfy the civil standard, namely that HM Treasury is satisfied on a balance of probabilities that there has been a breach of the EU sanctions. OFSI published guidance on the new powers in April 2017.

Iran Sanctions – impact of sanctions relief

The full details of the Iran Deal under the JCPOA are outside the scope of this

short chapter, but in essence the deal provides Iran with staged relief from the sanctions imposed by the UN and the EU, and many of the sanctions imposed by the US, in return for ongoing commitments from Iran in respect of its nuclear programme. The JCPOA envisages a 10-year time frame, with the agreement not fully performed until 2025. There are two main phases of sanctions relief, the first occurring on Implementation Day, which was January 16th, 2016, and the second not occurring until Transition Day, which is in October 2023.

The first phase of sanctions relief was triggered by verification by the International Atomic Energy Authority that Iran had complied with its JCPOA commitments. This resulted in the suspension of those EU restrictions that had been characterised as being “nuclear-related” (as opposed to “proliferation-related”) as well as equivalent US extraterritorial sanctions. It did not significantly impact on the US sanctions that apply to US persons. Some of the most significant changes from an EU perspective were the delisting of numerous individuals and entities, including Islamic Republic of Iran Shipping Lines, NITC and Iran Insurance Company, and the suspension of prohibitions relating to the purchase, import or transport of crude oil, petroleum products, petrochemical products and natural gas of Iranian origin. There will be further de-listings on Transition Day, as well as further lifting of trade restrictions. The final stage under the JCPOA is UN-SCR Termination Day, in October 2025, when, to quote the JCPOA, the “UN Security Council [will] no longer be seized of the Iran Nuclear Issue”.

A number of difficult challenges continue to arise even after Implementation Day. These include the risk of sanctions “snapping back” (i.e. being reintroduced) in the event that Iran does not comply with its JCPOA commitments, and the fact that the US domestic sanctions (i.e. those that apply to US persons – and therefore US banks processing US dollar transactions) are largely unaffected by the JCPOA, with the result that US persons are still largely prohibited from trading with Iran. In addition, the fact that certain restrictions remain in place, and there are still individuals and entities on sanctions lists means that it is important that businesses are aware of the remaining restrictions on trade with Iran, and take careful steps to ensure compliance, including detailed

due diligence, and the use of appropriate contractual language.

Sanctions – impact of Brexit

If and when the UK leaves the European Union (anticipated to be in 2019), EU sanctions will of course no longer have direct effect on UK companies and individuals. However, it is not anticipated that this will have a major impact on UK businesses, as it is expected that the UK will adopt national measures that closely mirror those adopted by the EU (in a manner analogous to the approach that Norway and Switzerland currently adopt).

While it is possible that the UK's domestic sanctions could diverge from EU sanctions in particular areas (where, for example, the UK considers that the economic cost to the UK of adopting particular restrictions outweighs the benefits of those measures), it seems unlikely that there will be wholesale differences, given the UK's long-standing support for EU sanctions, including those against Iran and Russia.

Compliance with international trade sanctions

Companies that are at risk of infringing sanctions by reason of the areas in the world where they trade and operate need to have processes in place to screen counterparties and other parties involved in the transaction (including banks) to check that they are not included on any sanctions list. They also need to review the products that are being traded and be aware of any relevant restrictions.

Finally, they need to work closely with their banks and insurers to check that those institutions can support the trade, and they need to think carefully about contractual protections to deal with existing and future sanctions risks. ■

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Can you afford turning a blind eye?

by Peregrine Storrs-Fox, *Risk Management Director, TT Club*

As evidenced by the well-publicised ransomware attacks on major transport organisations, including majors like A.P. Møller-Mærsk Group and TNT, cybercrime has become increasingly commonplace within the global supply chain. However, these attacks aren't targeted at large players only. Logistics businesses, forwarders, port and terminal operators, and carriers across all modes and of all sizes find themselves vulnerable virtually on a daily basis. Let us then look at the causes of cybercrime, the risks to operators throughout the supply chain, as well as the practical issues of protecting one's business from a cyberattack.

Put simply, the impact of cybercrime is now “just” another operational risk which all in the supply chain cannot afford to ignore. Similarly to data hacking resulting in cargo and property theft at depots, terminals, warehouses, and in transit, such incidents can involve sophisticated actors aiming to impact operations in their entirety with very costly consequences (amounting in some cases to hundreds of millions). The barrage of cyberactivity and the inability to identify the attackers (whether criminal, politically motivated or simply malicious), coupled with dependence on communications and control systems, means that infrastructure defence is crucial.

Hygienically challenged

The global supply chain and those that service it are particularly vulnerable to disruptive cyberactivity. Such operations are characterised by widespread office networks and a reliance on multiple third party suppliers. IT systems are predominantly of an in-house legacy

nature, which may be poorly protected by security software. Furthermore, there is a lack of open communication and reporting of past harmful cyberinvasions. Also, the level of basic cyberhygiene, i.e., knowledge concerning how one should behave to steer clear from getting exposed to cyber-risk, is poor, if not altogether negligible. For instance, with hindsight, investigations have revealed such practices as having the default “admin” as both the user's login name and password (“qwerty” or “12345” are common, too), or responding to emails from Nigerian lawyers/princes. All of these tend to increase the risk levels for this industry.

Ports, terminals, and ships representing, as they so often do, national boundaries, involving customs and other legal jurisdictions, are logistical or transshipment hubs for international supply chains, which makes them highly attractive to those seeking to smuggle contraband or target high-value goods. Due to their role in moving people and cargo across borders, ports and ships (and other modes of transport) are obvious targets for hackers, thieves, blackmailers, and others whose actions cause considerable loss and disruption.

For example, during the NotPetya attack last year, 76 port terminals run by Mærsk's APM Terminals unit were affected, resulting in widespread and severe delays, as well as a significant financial impact for the company (estimates say about nothing less than \$300m lost).

Redefine

The modus operandi of the modern cybercriminal is now going beyond simply misleading transport operators into thinking they are dealing with legitimate companies. Sophisticated hackers may now access and take control of operators' IT systems and equipment, extracting or manipulating valuable data in order to cause economic or even physical harm. While last year's attacks purported to be ransomware, a number of commentators suggested that the perpetrators were seeking to cause damage and disruption rather than to collect ransom payments.

The increasing risk posed by such cyberactivity has the potential to affect the legal obligations owed under shipping contracts, such as bills of lading or charter parties. In particular, evolving cyber-risks may come to redefine some of the legal definitions on which international conventions have traditionally relied.



All supply chain stakeholders need to ensure they have a robust cyberpolicy, including multi-layer defences, periodic stress testing of operating systems, and comprehensive threat assessments, all in order to implement an additional system or process mitigation and risk treatment as required.

The cyber-risks are increasing rapidly not just in terms of greater hacking and malware activity. The desire for supply chain visibility and efficiencies is driving technologies, such as the industrial Internet of Things, and access through smartphones and the like. There is a danger that rapid adoption of such technology means many companies have yet to consider thoroughly the cybersecurity implications in their procedures.

A number of supply chain players are beginning to implement processes based on accreditation to ISO 27000 or similar governmental data security standards, which will include robust firewalls, mail security, application controls, and effective data storage and recovery. Yet, one of the biggest threats is still human error, for example, disclosure of passwords to third parties or use of infected flash drives. Clarity in corporate procedures requires thorough staff engagement and follow-through with on-going awareness training.

Getting the priorities straight

Most supply chain processes have been created with little thought given to the threat of a cybercrime or attack. Furthermore, reliance on bespoke applications may reduce the ability to withstand a potential breach by a sophisticated hacker or a piece of malware (or require an upgrade to do so). The financial

pressure on all stakeholders in the current climate may mean that installing essential safeguards – such as virus protection or fail-safes to disable the remote control of equipment or processes in the event of an attack – has not hitherto been regarded as a priority, particularly for smaller operators.

Historically, there have been reports of incidents that initially appeared to be petty break-ins at office facilities, but a further investigation had revealed that criminals installed spyware within the IT systems of the operator. More typically, criminals may identify targets (generally individuals) whose protection from such risks is inadequate, leaving operational executives who travel extensively particularly exposed. By extension, trucks, ships, and aircraft are especially at risk, since drivers and crew, as well as other authorised personnel may be permitted to use portable media devices that can introduce malware or viruses into corporate systems (the same may hold true regarding “free” USB memory sticks handed out during industrial meetings). Ensuring that staff and executives in these “exposed” roles are adequately trained to recognise risks and react to suspect cyberactivity is therefore a critical initial defence.

Walk the talk

It's not just the supply chain; every business, including insurance, has to be vigilant in responding to an ever-changing threat. However, it may be that freight transport is experiencing a technological lag. According to data released by Accenture, while 85% of organisations intend to incorporate supply chain digitalisation in the next 12 months, only 50%

have aligned risk management with cybersecurity.

Technological advances in terms of handling equipment and IT processing undoubtedly provide greater operational efficiencies and control and, to a degree, opportunities for all operators in the logistics supply chain to mitigate their exposures, for example to theft and fraud. Unfortunately, they may also enable organised criminal organisations to use invasive cybertechnology, thereby posing a greater risk to legitimate trade and exposing counterparties to the risk of commercial and physical damage. A quite shocking thing, at the same time also a frustrating and disheartening one, is the fact that while cyberattacks have resulted in very tangible consequences in the real world, it seems that so far there have been no cases of bringing cybercriminals, that targeted the transport & logistics industry, to justice.

The race is on to increase industry awareness and ensure that there are adequate safeguards in place for both the human and technological risk factors.

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partnership events

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European Electric Vehicle Batteries Summit 2018
20-21 June 2018
DE/Munich

The two day event will bring together key industry stakeholders from the battery manufacturers, car manufacturers, energy storage component material developers, technology providers, grid operators, policy makers, environmental bodies, consultants.



Global Port & Marine Operations – 11th International Harbour Masters Congress
25-28 June 2018
UK/London

Open to association members and non-members alike, the 2018 congress will explore a diverse range of topics inspired by a single theme – Ports: Essential for Safe, Efficient and Secure Global Trade. The aim of the 2018 IHMA Congress is partly to recognise the valuable role performed by Harbour Masters in maintaining the smooth operation of the ports network. But it is also to explore how new developments in operational practices, technologies and infrastructure can make the trade of coming years even more secure and efficient.



Oil Spill India 2018
5-6 July 2018
IN/New Delhi

The event will tackle such issues as comprehensive revision to the old National Disaster Contingency Plan in terms of international standards, development of an online oil spill advisory system providing the trajectory of an oil spill, mapping of environmental sensitivities in coastal zones, capabilities for deployment of aerial dispersant spray system, as well as facilitating the regional oil spill contingency plans.



ITS World Congress 2018
17-21 September 2018
DK/Copenhagen

The 2018 Congress will focus on how ITS solutions can contribute to liveability, a greener environment and lower congestion. Copenhagen strongly believes in employing ITS and the driving ambition is to become the first carbon-neutral city by 2025.



Trans Expo Odessa 2018
26-28 September 2018
UA/Odessa

International Black Sea Transport Forum provides a platform for dialogue and creates new opportunities in the transport industry. The forum brings together international exhibitions such as: TransUkraine, TransRail Ukraine, Commercial & Municipal Transport and the biggest Ukrainian marine transport exhibition ODESSA 2018. The 21st International Conference "Ukrainian transport system development: problems and prospects" will also be there.



The 6th Annual Arctic Exchange
27-28 September 2018
NL/Amsterdam

The Arctic Exchange is making the next Exchange the most unrivalled business to business higher north networking opportunity of 2018. The Arctic Exchange agenda covers a full spectrum of the sector and the most important issues currently facing the polar region – including environmental, social and economic factors, serving as a platform to look beyond the immediate horizon.



SIBCON 2018
1-5 October 2018
SG/Resorts World Sentosa

The conference will be attended by key decision-makers from the shipping and marine fuels community, and they will converge in Singapore to outline market potential, growth segments, and strategies to operate in the current environment.



Bulk Liquid Storage
3-4 October 2018
ES/Cartagena

Bulk Liquid Storage 2018 will bring together senior representatives from the bulk liquid storage industry to discuss all the latest market updates, developments & business opportunities. The event will cover current key challenges and issues faced by the industry and provide in depth discussions and analysis of today's European & global policies and regulations, followed by recent market dynamics changes impacting on supply & demand trends.



China International Logistics and Transportation Fair
11-13 October 2018
CN/ Shenzhen

CILF is one of the leading logistics and transport expo in Asia dedicated to logistics, supply chain management, ports and shipping, e-commerce, IT solutions for transport, as well as mobility in general, air cargo, and material handling. Last year the event was attended by 1,861 exhibitors from over 52 countries, and 134,500 visitors from 81 countries.

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