SHIP
MANAGEMENT
INTERNATIONAL

Evolution not revolution

Shipping - ready for a new dawn

An Inmarsat operations centre

CONNECTIVITY
platforms have ways of
making us talk between
SHIP AND SHORE

Conservative, traditional, slow-moving. It was not so long ago that this was the all-too-familiar view of the shipping and maritime industries. But the times seem to be a changing. Manufacturers, suppliers and operators are suddenly realising the benefits of a faster-moving, better-connected sector and adopting the latest techniques and know-how to make it happen.

The scale and speed of ship-to-shore links between vessels and land-based sources has helped to transform shipping from its former dependable but undynamic self to a faster, more adaptable approach to cargo-carrying. The satellites are faster, the technology smarter and the results are getting progressively bigger and better.

A series of platforms recently produced by leading providers have given ship owners, operators and managers a multitude of connectivity options from Big Data-handling to fraud prevention. One of the newest is Kongsberg's Kognifai which is being tested as part of the SESAME Straits project (Secure, Efficient and Safe maritime traffic Management) in the Straits of Malacca and Singapore pinpointing traffic blackspots in congested waterways.

"This will improve the safety of vessel traffic and enable 'just-in-time' arrival of vessels while improving the efficiency of existing infrastructure and reducing the environmental footprint," said Olivier Cadet, Executive VP of Products and Services at Kongsberg Maritime.

The Kognifai platform will transfer route information collected onboard vessels into Vessel Traffic Systems. One of its key benefits is predicting mechanical failure.

"By collecting sensor data for temperature, vibrations, pressure and energy use we are able to move away from calendar-based maintenance on critical equipment onboard ships. Engines are a good example. The world of big data also enables a more systematic detection of abnormal conditions on equipment. With offshore wind, for instance, we have the capabilities to predict wind turbine failure six months in advance, giving our customers the ability to plan their logistics and maintenance operations more efficiently."

Since its launch in 2016, Inmarsat's industry-leading connectivity solution Fleet Xpress has been adopted by more than 10,000 ships which demonstrates that the market "has been truly ready for the connected ship and the network-supporting maritime business applications," said Peter Broadhurst, Inmarsat's Senior VP for Safety and Security. Inmarsat is currently adding a cyber security solution to its Fleet Xpress hardware.

With Singtel's Trustwave providing the software, the Unified Threat Management (UTM) solution, as it is known, will be integrated with Fleet Xpress onboard vessels and protect data and reduce cyber risk for maritime companies. The solution also offers a suite of cyber security defences such as advance firewall, anti-virus, intrusion

prevention and web-filtering, backed by global 24/7 support.

Ronald Spithout, President of Inmarsat Marine, said: "As we move from traditional shipping into the ship intelligence era, the threat of cyber attacks has never been more real. Risks from malicious attacks and unlawful access to a ship's intelligence, its system infrastructure and networks cannot be ignored, and the shipping industry needs to take action."

Another platform that gives vessel owners, operators and Masters heightened cyber security and helps keep cyber fraudsters at bay is Marlink's Xchange. The platform also allows fleet managers to manage Marlink's Sealink vessel communication services centrally from the shore "which removes a significant amount of admin from the captain so they can focus on the job of running a safe and efficient ship. Also, with Xchange, crew can reliably be provided with available communication lines to easily stay in contact with their families and friends via email, internet and social media. It also optimises the available bandwith to ensure important IP applications are always available," said Tore Morten Olsen, President of Maritime at Marlink.

Users of Marlink's Sealink services have a choice of global Ku, Ka and C-band VSAT (very small aperture terminal) solutions all of which can be combined with L-band mobile satellite services and GSM/3G/4G in multi-band networks.

But how much do these systems speed up ship-to-shore communications for vessels?

"This depends on what systems a vessel was using before, but the speed of connectivity on VSAT services compared to L-band services can be much higher. This enables ships to better use digital applications that can help them increase efficiency, such as engine-monitoring solutions that send data back to shore, contributing to savings on fuel consumption or equipment maintenance. Speed is important to enable more use of data-focused applications, but VSAT also introduces other benefits including more cost control as the service cost is the same every month," said Mr Olsen.

"For the ship owner and operator, vessels can be made much more efficient through the digitalisation of operations with, for instance, email for business, electronic forms and reporting, and downloading of navigational chart updates on ECDIS. But it gets really interesting when sitcom, and VSAT especially, provides the IP link for advance software applications that can analyse data generated by sensors onboard. This provides in-depth intelligence and insight into how a vessel and fleet is being run, which if applied correctly can introduce significant operational cost reductions," he said.

"We have developed a portfolio of crew-focused solutions that help the ship owner to deliver high levels of crew communication facilities either free-of-charge or at low cost. These include Universal Card, which provides simple account management and billing, and Xchange BYOD, which enables crews to connect their own devices and make calls or access the internet onboard," he added.

One provider that is using the know-how of its clients as well as teams of IT specialists and a "growing number of R&D people" to help design its latest product, Innovation Garage, is Dualog. The platform was named after the famous mantra 'rules of the garage' where the tools and ideas are shared, there is no politics or bureaucracy and where radical ideas are not seen as bad ideas.

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Dualog CEO Morten Lind-Olsen said the platform "gives us the opportunity to drive fresh blood into the IT industry and look to the future in a new way. We are recruiting people at the forefront of the industry from all over the world – we want to work with people who can contribute in a passionate way and have a track record of creating exciting new ideas."

"We are also working with our existing customer base of 3,000 ships to prepare for the future. Broadband at sea is becoming more available and affordable which again opens up a new world of opportunities to our customers. The Internet of Things is one focus area that is very much unexplored and where the shipping industry is facing many challenges such as with existing hardware as well as understanding and fully exploiting Big Data."

Someone who believes it is not just the amount of data and information that ship-to-shore connectivity produces but the way it is interpreted and the insights it produces is Captain Claus Hyldager, the former CEO of Inchcape Shipping Services.

He has just launched Nisomar, a data-driven maritime services company, based in the UK's Port of Tilbury: "In a sector steeped in history, we still retain centuries-old processes and practices. Despite the market risks and the knife-edge economics wrought by significant vessel oversupply, many owners, operators and charterers are working without access to essential information. Not least they need a complete understanding of trading patterns, cargoes and the position of all vessels regardless of owner," said Capt Hyldager.

Nisomar has been "founded on the belief that the use of technology in shipping is woefully inadequate. Enterprise resource planning (ERP) solutions may have been around for decades, ship-to-shore communications have advanced, but adoption of new technologies and the use of Big Data in the sector is poor. We believe there is now a demonstrable opportunity to leapfrog evolutions in other sectors, to make innovative use of global shipping data, and to bring about wholesale reform in shipping," he said.

Capt Hyldager's idea is to develop a series of 'bridges' around the world. This creates a bridge of information between the client and a network of sub-contractors that can supply the local and global information they need. For instance, if there is congestion in a port six days before a vessel is due to berth the bridge will feed them that information so they can adjust their voyage plans.

"In the aviation industry there is a high degree of predictability and the shipping sector needs to learn from the aviation sector so that if something unforeseen happens, they can find a solution in advance as they do," he said.

Capt Hyldager told *SMI*: "The data is already available and we will be looking at ways all that data can be utilised and looking at all the facets of a voyage from weather updates, fuel consumption details, port arrival information and trade flow forecasts and use 'Silicon Valley' methods to interpret the data to help vessel owners, operators and managers." The former Inchcape CEO is working with a launch team of industry specialists

ABB Ability is the new platform from technology specialist ABB. Built on Microsoft's Azure cloud platform, the solution combines a range of services including an asset health centre that uses "predictive and prescriptive analytics" to identify maintenance issues based on probability of failure and asset criticality, a solution that enables customers to undertake major projects on a faster schedule with fewer cost overruns than before and a smart sensor solution which transmits data on vibration, temperature, loads and power consumption to the cloud. As soon as any of these solutions deviate from the norm, it alerts the operator to take action before the motor malfunctions.

Early tests show its smart sensor solution leads to a reduction in downtime of motors by up to 70% and extends lifetime by up to 30%. While acting on the data to optimise the motor's performance reduces energy consumption by up to 10%.

ABB has also upgraded its remote diagnostic services (RDS) for vessel maintenance. RDS can be used with ABB Ability on fleets with limited bandwidth availability or large numbers of data points. Kenneth Nakken, ABB's VP for Digital Services in the marine and ports sectors, said the company expects to be remotely monitoring 3,000 vessels by 2020 through its integrated operations centres in Asia, Europe and the US.

"Our RDS services are focusing on three main parts – troubleshooting, prevention and prediction. When subscribing to prevention and prediction ABB is aiming to reduce vessel maintenance by documenting equipment performance and condition. By the constant surveillance of equipment and systems, ABB is notified within minutes if any of the analytics are indicating abnormalities which will be followed up and rectified before critical failures occur," he said.

Visits by ABB engineers have shown "tangible evidence" of improvements in maintenance as well as reductions in the number of engineer visits to ships using RDS, said Mr Nakken.

"An internal study found shipowners can save up to 50% on maintenance costs by monitoring equipment using RDS. There has also been a reduction of up to 70% in visits to vessels by ABB engineers," he said.

It is cost savings that are at the root of most connectivity solutions and one provider, KVH, has introduced a novel way for users to cut out the capital costs of equipment and hardware. For a single monthly fee, KVH gives users a connectivity service called AgilePlans. For a monthly subscription of $499, the company offers a package of 500MB of connectivity plus hardware, installation at selected ports, entertainment and training content and global support; while for 2GB plus the other add-ons, users pay $799-a-month and for 20GB, $2,999.

"Connectivity is the gateway to digital transformation for shipping, but the complexity and comparative expense of satellite communications has acted as a brake for many operators. Connectivity as a service makes real sense, bringing simplicity, accessibility and scalability without the need for upfront Capex, so the AgilePlans service is groundbreaking in that respect. But this isn't just about cutting costs, it's about delivering value, which makes the inclusion of crew content and eLearning in the KVH offering really significant," said K D Adamson, Founder of connectivity specialist Futurenautics Group.

Two of KVH's key aims are to help customers adjust to changing market conditions and to support fleet expansion or contraction when needed. AgilePlans subscribers can also end their subscription at any time without penalty.

"Ship operators know they can drive efficiency when they bring fast and reliable broadband onboard and with the AgilePlans service they will be able to get the benefit from day one. As we approach the 10th anniversary of our mini-VSAT Broadband service, this is one more way we are innovating for our customers, particularly in the crucial areas of connectivity and business flexibility," said KVH CEO Martin Kits van Heyningen.

Oliver Clauser of Reederei Kopping, Technical Manager of a ship portfolio managed by the Ernst Russ Group, which recently ordered the solution, said: "KVH's subscription programme provides the advanced communications solution we need for our vessels, and includes all the factors we consider critical for our operations – a high-performing satellite communications system, the data consumption we anticipate for crew welfare and remote access to the ships' IT systems among other things. The programme's low investment cost was a deciding factor as well, given that KVH provides not only the equipment itself but the maintenance and installation." ●