Smarter Shipping

Enabling a machine-learning revolution

Shipping is vital in today’s global economy, and it’s one of those things that many of us take for granted ‘just works.’ Of course, it’s not nearly so simple, and in an era of squeezing the last drop of efficiency out of anything and everything, smarter shipping has become vital. Here, Frank Coles, CEO at Transas, outlines how digital technology from Transas is combining data with machine intelligence to remove the obstacles standing in the way of smarter shipping.

As shipping sails into the digital age, vessel owners, operators and managers are gradually unlearning a nervousness of technology, replacing it with an eagerness to apply technological solutions that improve the performance of ships, entire fleets and - ultimately - the bottom line.

Numerous innovative solutions have emerged to satisfy this growing appetite, taking advantage of advances in satellite communications, cheaper and more ubiquitous computing power, and new techniques in software engineering resulting in greater machine intelligence.

To get an idea of how far we have come, imagine how a demonstration of a driverless car would have grabbed front page headlines in the mainstream press 10 years ago; today such tests are hardly reported outside tech news outlets. In the long-run, these technologies may lead to autonomously-operated vessels. For the time being though, they provide a springboard that will accelerate the transition to smart shipping.

Allowing a freer exchange of information

However, as things stand, the technologies in question will fail short of their full potential, according to Frank Coles, CEO of Transas, the innovative, digital solutions company. “We are unlikely to reach full speed ahead because most contemporary work is in isolation. Developers often focus on efficiency gains for one job; they might do it well but they fail to comprehend the full picture. To date, the industry hasn’t had the right support platforms to integrate its digital solutions and fully embrace a smarter way of operating ships and managing fleets. Overcoming this barrier will depend on breaking down these artificially imposed constraints and joining the dots.”
For Coles, this realisation has become a focus for R&D at Transas, resulting in the birth of THESIS: the Transas Harmonised Ecosysteem Integrated Solutions. Announced in early 2016, THESIS is intended as a flexible shipping industry-specific platform that will allow a freer exchange of information between stakeholders in the maritime supply chain. Sharing the data generated on board ships, across fleets, and at shore-based facilities more widely will create a multiplier effect in the value derived from that data.

"Imagine if the shipping industry had access to its own powerful operating system — like Apple’s iOS or Google’s Android for smartphones," enthuses Coles. "Consider how powerful it is to have all your devices connected and controlled by a single user profile which lets your data flow seamlessly between them thanks to cross-platform integration. As we have all personally experienced, this silently facilitates faster and more efficient ways of connected working and socialising. It is also scalable as evidenced by the spread of these networks into our homes and cars.

"Now, transplant that approach to the maritime industry with the introduction of a platform for ship owners and operators, where instead of the captain's range of personal devices being linked and synced with each other, it's the bridge operations and the control of information and processes that is shared from ship to shore and across fleets."

Reducing human error with machine learning techniques
The elements required to build this platform — THESIS — are mostly already in existence; they just haven’t been joined together. To expedite matters, Transas entered two strategic partnerships earlier this year. Its new relationship with Japan Radio Company (JRC) will see the two companies working together on R&D, product distribution and project collaboration. One of the aims is to unite JRC’s reputation in hardware with Transas’ expertise in software to produce next-generation e-navigation solutions for both SOLAS and non-SOLAS markets. Initial projects include collaboration on the joint design and development of new electronic chart systems and radar products.

Transas is also partnering Satcom Global to incorporate integrated connectivity into THESIS, bringing the benefits of Satcom Global’s Aura VSAT network to vessels using Transas’ navigation and voyage optimisation solutions on board to connect seamlessly with shore-based fleet operations centres.

Crucially, Transas is not limiting its thinking to ship-to-shore data exchange. THESIS is about connecting ship, operations office, training facilities and ship traffic control to create a cohesive community capable of joined-up decision-making. It will unite and empower stakeholders to achieve higher operational standards and greater environmental performance, while improving efficiency and safety.

THESIS is not simply a repackaging of existing products into a combined solution. Instead, Transas is working on entirely new software solutions to exploit emerging technologies such as artificial intelligence, to bolster situational awareness and enhance decision-support on board and on shore.

Specifically, the company plans to launch advanced software tools that reduce the risk of a human error on the bridge culminating in a serious incident. In a first for the industry, these will employ machine learning techniques to detect anomalies in vessel and operator behaviour and raise the alarm before the consequences of an action or momentary lapse in attention become irreversible. In addition to vessel track prediction, the solutions will detect a variety of excessive or unusual manoeuvring patterns, keeping an eye on parameters such as speed and rate of turn, as well as unexpected deviations in fuel consumption.

In addition to the safety benefits, the insight derived from pulling together a wider selection of datasets can be harnessed to boost operational efficiency at individual ship and fleet level in ways so far only imagined. Integrating metocean data, information from traffic separation schemes and regional regulations on acceptable fuel types will make it possible to optimise vessel routing to reduce fuel consumption based on new inputs that enrich the efficiency algorithms. Using machine intelligence to augment the human in the loop can help in other ways. For decades, shipping companies have conducted much of their business using spreadsheets, emails, and phone calls. Consequently, both operational decisions and transactions with regulators, customs, and other players in the supply chain involve disconnected conversations, unnecessary paperwork and administrative overheads. Coles believes there is scope to automate some of those workflows, create greater transparency and uncover opportunities for optimisation.

Enabling a revolution
To substantiate this view, he points to Maersk, which last year announced that ‘everything that can be digitalized will be digitized.’ “It is not doing this for novelty value but sees real commercial value in adopting digital solutions to remove delays and inefficiencies,” he says.

Putting in place a unified platform like THESIS is a critical step in enabling this revolution to come about. It ensures the necessary raw data is gathered, stored and easily accessible to the relevant stakeholders, as well as any new digital tools and solutions that emerge to extract meaning from data. “Technology shouldn’t be an end in itself – but a tool to achieve an end. We want to help the industry improve by helping it make better decisions and boost competitive advantage,” concludes Coles.