Digital pivots

by Mark Warner, *Head of Marketing, Maritime Performance Services, Lloyd's Register*

Maritime companies should see artificial intelligence (AI) as a transforming technology that will allow them to get ahead of the market. Integrating AI in autonomous shipping, navigational support systems, and vessel performance optimisation solutions will deliver value to users when appropriately implemented. Admittedly, the adoption of this technology in the maritime industry is at a nascent phase, and its development will depend on the computing infrastructure and the connectivity solutions available. However, it is likely to be among the technologies that will soon experience industry-wide acceptance, given the level of investment being poured into the disruption of the global supply chain.

Lloyd's Register's new report, ***Artificial Intelligence in Maritime***, produced in collaboration with Thetius, highlights that the maritime industry is forecast to spend $931m this year on AI solutions. That figure is forecast to more than double in the next five years to $2.7b, a compound annual growth rate of 23%.

This rapid growth is driven in part by investment in the sector. In the last 12 months, $331m has been invested in start-ups and small- and medium-sized enterprises developing AI solutions for the maritime industry, with a further $43m in grant funding being awarded to develop the technology for the maritime sector around the world.

AI affects all

A lot of the initial AI research & development has been focused on autonomy and sustainability, with the ambition of building the capability of a smart fleet of vessels. Many companies have begun by addressing incremental changes such as optimising individual ship performance, while others are experimenting with fleets capable of moving cargo remotely and safely.

As the regulatory landscape shifts the maritime industry's focus towards sustainability, how the market currently operates and plans to operate in the future will change. This does not only pertain to the environment but also to the people involved in the industry's growth. From the seafarers to the policymakers, every individual that is involved in enabling the maritime supply chain will be affected by how AI will take its place in the industry.

Currently, there are several use cases for AI in maritime that have begun to gain traction. This includes decision support solutions (autonomous navigation), its use for generating insights into machinery health (digital health management and remote diagnostics), and its integration in autonomous ship systems, which enables an alternative future of commercial fleets without crew (virtual commissioning).

One area where Lloyd's Register's (LR) Maritime Performance Services, through its subsidiary i4 Insight, has developed vast experience is in the use of AI for vessel optimisation and helping to ultimately improve ship performance. "We have found that traditional and legacy data analytics only look at 10% of vessel data, whereas our AI models can now look at close to 100% of vessel data and process this data instantaneously to create extremely accurate vessel performance insights around fuel consumption, speed, trim, hull fouling and power consumption," highlights Andy McKeran, LR's Chief Commercial Officer.

Without question, the combination of massive investment and rapidly increasing demand means that AI is one of the fastest growing digital technology sectors in the maritime industry today. However, knowing how to capitalise on the AI opportunity can be difficult and fraught with risk. It calls for trusted advice.

To help maritime stakeholders find suitable AI providers and solutions for their business challenges, LR launched last December a standardised digital register of LR-certified AI providers and solutions – a first of its kind for the maritime industry. Using the **AI Register**, maritime companies can minimise the risk and cost of investing in AI while successfully benefiting from the technology's advances, improving business outcomes and their competitive advantage.

Towards digital maturity in shipping

Digital transformation is reshaping the global maritime business, bringing a new era of innovative uses of data to help with the decarbonisation and optimisation of shipping. **A report by Thetius** at the end of last year highlighted that the pandemic accelerated digitalisation by over three years, powered in part by the need to move away from physical or manual processes.

In assessing maritime's progress on the digitalisation journey I have looked to what senior executives in all industries consider necessary for transformation – otherwise known as 'digital pivots,' as told by those execs to Deloitte. There are other 'pivots,' but I would say from my perspective of working with and talking to a number of shipping companies over the last 25 years, those highlighted below are absolutely key to digital maturity in shipping.

Here, I share an update on why we are closing in on the tipping point for maritime innovation by diving into detail around each pivot and its level of maturity in the sector.

A flexible, secure, and connected communications infrastructure both onboard ship and ashore

In a maritime context, this specifically relates to connectivity and the cyber resilience of that infrastructure. Connectivity can mean a lot of different things to different people, but from a commercial maritime perspective, there is a requirement for high-speed broadband as an enabler for digital transformation with at least speeds of between 4-8mbps and ideally more. Don't forget that until about seven years ago, there was just the Inmarsat L-Band global offering through Fleet Broadband which was only offering speeds of up to 564kbps. Since then, there has been a huge increase in the number of VSAT providers and the speeds and capacity available.

There's a widespread misperception that satellite communications are hugely expensive and, as a result, not widely used. In fact, what we're seeing is a real increase in satcoms usage, especially since the pandemic, both for crew welfare and operations.

Pre-pandemic, the average commercial merchant vessel was transferring around three gigabytes per day, on and off board. Now it's more like 12-14 gigabytes per day. That's a fourfold increase in data consumption per ship over 18 months. Satellite network providers are catering to this trend, with Inmarsat now fine-tuning its new ORCHESTRA all-in-one system, which includes LEO and terrestrial services, plus a host of new low Earth orbit satellite networks such as Starlink and Oneweb now actively targeting the maritime industry.

Capacity for connectivity is just going to increase and increase – Starlink is already offering downloads of over 100mbps for their initial maritime service. And with so much competition, the price of packages will come down as well, which means that we have reached a tipping point for this pivot.

On cyber security, there have been several high-profile maritime issues, so most companies now have their own IT and cyber security department or outsource this to a third party. The International Association of Classification Societies has also set recommendations on cyber security, and there are some very sophisticated cyber resilience packages in place, or they are being put in place; everyone realises you need a tight security blanket around your communications infrastructure.

Intelligent and automated workflows – including moving from digitising processes to full digitalisation and autonomy

Here, allow me to explain that merely automating manual processes – or 'digitising' – is not enough. Digitalisation requires a changing of business resources and processes as well. There's still confusion around automating workflows and data collection, but companies are starting to work out what needs to be digitised and what can be digitalised. In other words, change businesses processes, and bring in experts or 'digital talent' to assist with this.

Shipping companies are beginning to understand why data quality is important and maximising their use of data rather than creating data silos where software providers don't talk to each other. Let me give the example of flexible enterprise resource planning systems which work in an automated and intelligent way – such as that offered by Hanseaticsoft, LR's cloud-based ship management solution – which can be described as really 'sweating the data' and using across multiple functions from planned maintenance to procurement and crewing.

Data maturity – including the collection, transfer and analysis of data from ship to shore, and the avoidance of data silos

Transferring data ashore for its analysis and use requires a suitable platform for integrating all the collected inputs, and this is becoming even more important with requirements for emissions reporting and the new Carbon Intensity Indicator. Fuel monitoring, both for environmental and cost reasons, is going to become increasingly vital. I would say that we are not quite at the tipping point for this particular pivot, as there's going to be a real step change in how to get that data and how to get it off vessel quickly and use it in an intelligent manner.

Requirement of digital talent

I believe this point is hugely important but often overlooked in a sometimes conservative and inward-looking industry such as shipping. Therefore, it's probably the furthest away from a significant tipping point. If you haven't got people who are digital-savvy and understand how to use data and automate workflows, you're not going to be digitally mature. We're finding now that companies have digital strategies and positions like Chief Digital Officer, Digital Transformation Officer, 'data scientists' and the like. It is amazing how the conversation changes when you have digital talent in an organisation.

People who are coming in need to have a real understanding from a business perspective, not merely a technical one, of the needs of a shipping company that is undergoing digital transformation. They're being put there to change digital attitudes internally.

Collaboration and the establishment of digital spin-offs, partner ecosystems, and start-up accelerators

There has been a noticeable shift in companies working far more closely in the last five years. It's not just pairings between comparable businesses. Maritime accelerator programmes are focusing on key topics like decarbonisation or safety – Safetytech Accelerator, established by Lloyd's Register Foundation and LR, is a fantastic example of this. Others such as Rainmaking and Pier71 have developed their own accelerator programmes around decarbonisation in recent years.

Another trend has been for large- and medium-sized shipping companies and ship managers to spin out their own digital divisions so they can work with other companies – these include OrbitMI, AlphaOri and ZeroNorth. On the quayside, accelerators such as PortXL are doing their job in connecting the port industry with start- and scale-ups.

In short, I believe shipping is making good progress in adopting all five 'pivot points' that he sees the industry needs to fully embrace digital transformation, which in turn will prove the 'tipping point' for real innovatory change. ■

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