

Guest contribution: Grant Ingram  
CEO of Innovez One for EMEA

## Do ports need AI to increase efficiency?

The promise – or threat – of Artificial Intelligence has dominated 2023, as virtually all industries have had to confront the potential impact of the technology on their sectors. There can be few professionals – especially knowledge workers – who haven't wondered at some point this year about which aspects of their roles might end up being automated, particularly as they've played around with tools such as DALL-E or Chat GPT.

The port sector is no exception. Now more than ever, ports are in fierce competition with one another, while needing to manage volatile global supply chains, the decarbonisation transition, and an increasingly unstable geopolitical landscape. It's no surprise therefore that AI is gaining traction in the sector. After all, much of the work of making a port more competitive and efficient comes from analysing a multitude of data and signals, and trying to organise variables more efficiently. It's easy to see how AI might just look like a big red button with »increase efficiency« written on it. And the investment seems set to follow; a report from Lloyds Register and Thetius earlier this year, »Out of the Box«, projects that the AI-driven systems and vessel autonomy market will be worth a combined \$5 billion by 2028 with significant growth and crossover of both sectors expected.

Whenever there's this much hype around a project, however, we need to look under the hood. We might remember a similar level of enthusiasm



around blockchain, tokens and web3 taking over maritime conference agendas around five years ago. There are some use cases for the technology out there, for sure – but it's safe to say that blockchain hasn't become as ubiquitous as it was anticipated a few years ago. We're far from seeing the kind of secure, decentralised, universal trade platforms that were so often theorised.

So is the same going to happen with Artificial Intelligence?

### How Intelligent is the Current Cohort of AI?

To answer this, it's important to understand a bit more about what we're actually working with. The AI that we're currently seeing powering internet applications

(chatbots like Chat-GPT or image generators like Dall-E) is based largely on pattern matching, using visual databases, and large language models (LLM). It's good at creating text and visual outputs that match certain inputs, but we shouldn't mistake an AI programme (in the model of Chat-GPT) that has been trained on, say, medical textbooks, to have a functioning understanding of biology. Rather, it will be putting together questions and answers based on whatever corpus it has been fed.

The terminology »AI« – Artificial Intelligence – is doing a lot of work here, convincing (or at least trying to) investors, users and media that there is something more going on. Just because a LLM-powered AI solution can produce correct answers in limited circumstances, it does not necessarily mean that it can think and solve problems in the same way as people – and can, therefore, solve bigger problems, faster and cheaper.

### The Role of AI in Port Operations

What exactly does that mean for the maritime sector? With ports and shipping operations, there is no room for mistakes. Unlike conversation algorithms, we can't experiment at will with port efficiency and safety.

To answer this, we need to recognise that that not all AI is the same.

What makes a viable maritime application of AI different from a chatbot?



© Innovez One

The difference is in how it is developed and trained. Training methods for the conversation algorithms behind chatbots like ChatGPT, for example, are entirely different from those used to train the models used in our MarineM system which optimises port, tug and pilotage operations. The datasets, too, are different: rather than learning from a huge amount of information, MarineM is fed a carefully curated dataset on the ports' operations and given a clear set of parameters.

When safety is at stake, there are right and wrong answers. Right answers optimise operations without compromising safety. Wrong answers result in loss of efficiency and possibly loss of assets or loss of life.

We can teach the AI algorithms what the good answers are to reinforce safe outcomes. In practice, this is done with a series of »reality checks«, where, for example, we get MarineM to predict the duration of a job, and then check this prediction against the real duration of the movement once the job is completed. Knowing whether the initial prediction was right or wrong, and by what margin, helps the algorithm learn from the ports' specific operations to improve its accuracy.

Using the predicted duration of all jobs, the MarineM algorithm deploys resources such as tug and pilot boats in the most efficient way given multiple constraints, such as the need to assign pilots to specific vessel types and sizes depending on their licence, the types and number of tugboats required for each job, and the shuttles needed to take the pilots to the correct boarding grounds.

The algorithm then faces another reality check where its suggested scheduling is assessed against actual results. Did the pilots get on board on time? Did they also get to the next ship on time? Answers to these questions help the algorithm fine-tune its solutions moving forward, while the clear framework also guarantees that MarineM will not come up with unrealistic or dangerous solutions.

If it's trained on the right parameters, and targeted carefully, AI can have a transformative effect. However – that's not to say that AI is a necessary precondition for efficiency gains using digital platforms.

An »ain't broke, don't fix it« mentality means in many ports, a lot of important information is stuck in excel spreadsheets and whiteboards – often on old versions of Windows. When we think about the

level of digitalisation and connectivity in the shipping industry today, we're talking about web 2.0 or even 1.0 in some cases. Replacing paper and whiteboards with an up to date, connected digital solution can be the first step on a digitalization journey, turning data into actionable insights. This could be the first step in freeing up berth space, or organizing the dozens of variables that go into a single port call more effectively.

Artificial intelligence has huge potential for our sector – but it's not necessarily synonymous with efficiency, and the biggest efficiency gains might be currently hidden in whiteboards, with little need for AI. But either way, a co-ordinated digital approach will form the foundation for ports to grow, directly improving operational efficiency, while also giving critical insights that help inform investment decisions on new infrastructure. ■



## INTELLIGENTE ALGORITHMEN MACHEN DEN MARITIMEN SEKTOR NACHHALTIGER

Um einen ressourcenschonenden, zeitoptimierten, nachhaltigen und sicheren Betrieb der maritimen Infrastruktur in Zukunft sicher stellen zu können, braucht es Daten- und KI-basierte Ansätze. Dabei setzen wir auf innovative Lösungsansätze wie Sensorsimulation, softwaredefiniertes elektrifiziertes Boot oder den virtuell intelligenten Hafen mittels Digital Twin. Wir gehen diese tiefgreifenden Herausforderungen gemeinsam mit Ihnen an und denken ganzheitlich vom Hafen über das Energiemanagement bis hin zum Schiff.

