

Future Thinking S3 E3: Charting a Digital Course with AI in Shipping

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<v SPEAKER_1>Hello, and welcome to Future Thinking, an Alongside mini-series from NorthStandard, one of the world's leading marine insurers.

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<v SPEAKER_1>I'm Helen Barden, and in this mini-series, we will be opening our minds to the opportunities and challenges that new technology and a more digitalized industry can bring.

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<v SPEAKER_1>In today's episode, I'm delighted to be joined by Professor Adam Sobey of the Alan Turing Institute, which is the UK's National Institute for Data Science and Artificial Intelligence.

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<v SPEAKER_1>Together, Adam and I will explore how artificial intelligence or AI is affecting or will affect the shipping industry.

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<v SPEAKER_1>Thanks very much for joining me today, Adam.

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<v SPEAKER_2>Yeah, thanks very much, Helen.

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<v SPEAKER_1>We'll come on to the areas of focus of the Alan Turing Institute shortly, but I just wonder if we could go back to basics and if you could explain artificial intelligence in kind of basic terms for those of us that are less technologically minded.

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<v SPEAKER_1>Yeah.

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<v SPEAKER_2>So it's always a tricky one.

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<v SPEAKER_2>I think lots of people have their own definitions of exactly what AI is.

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<v SPEAKER_2>But I guess for me, it's broken up into sort of three main disciplines, sort of data science, machine learning, and AI.

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<v SPEAKER_2>The data science side would be the sort of statistics type work that you might do, the way in which you gather data and can visualize it for benefits.

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<v SPEAKER_2>And I think we've used that a lot in engineering for a long period of time.

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<v SPEAKER_2>Machine learning is around how you can get different algorithms to actually learn from data, and to sort of start to do things like regression analysis, which is a common thing for us in engineering, or perhaps around classification of different data sets.

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<v SPEAKER_2>So does this thing fall into this category or another category?

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<v SPEAKER_2>And then I guess artificial intelligence itself is somewhere around human level intelligence or equivalence to human level capabilities in a set area.

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<v SPEAKER_2>And so I think we're starting to see some of this in things like autonomy, where you might start to see some ships or some cars starting to perform at human levels, or perhaps around large language models where people are starting to interact with those in a way that perhaps is a little bit beyond what we've seen in algorithms before.

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<v SPEAKER_1>Yeah, I mean, it encompasses a lot, doesn't it really?

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<v SPEAKER_1>And I think throughout this conversation, we can pick up on some of those points like autonomy and others.

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<v SPEAKER_1>Specifically for maritime, what areas are you focusing on?

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<v SPEAKER_2>Yeah.

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<v SPEAKER_2>So I think it's interesting because AI can be used sort of throughout the life cycle of the vessel.

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<v SPEAKER_2>So we certainly do work in design and how we can utilize AI to support that.

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<v SPEAKER_2>A great example is with Polozinski, where we create the layout designs for the boats now.

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<v SPEAKER_2>We use it in manufacturing to support the efficient supply chains or to improve safety through the manufacturing process, perhaps capturing video of people doing work in a production yard, trying to catch incidents before they might occur through those sorts of elements, or in operation where we can see really large efficiency improvements, literally without changing any of the design of the vessel, but just operating it at its optimal potential.

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<v SPEAKER_2>And as we move forward, I'm hoping that we do more work in recyclability and the end of life of vessels as well.

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<v SPEAKER_1>And just in relation to the ship design or vessel design that you talk about, and your use of AI there, is that also in terms of optimizing the efficiency of a vessel from the design stage?

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<v SPEAKER_1>Because you talk about as well the kind of operational efficiency side that AI can be used for.

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<v SPEAKER_1>But is AI used at the design stage for efficiency purposes?

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<v SPEAKER_1>And if it is, how is the AI information kind of verified, if you like, to ensure that it produces the right results?

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<v SPEAKER_2>So we are starting to use this in various areas.

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<v SPEAKER_2>We've used it in hydrofoil design and in lightweighting structures.

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<v SPEAKER_2>And we're actually looking at this as a tool for ship hull structures as well.

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<v SPEAKER_2>And I know various companies have done work in this area.

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<v SPEAKER_2>I think we're starting to see very good results in this sort of aspect, but the validation is always tricky.

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<v SPEAKER_2>And I guess it's no different for the AI structure than any structure that we've done before.

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<v SPEAKER_2>I guess it's around looking for plateaus rather than peaks in performance.

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<v SPEAKER_2>These tools are very good at finding optimal spikes, but do those actually happen when you build a design and perhaps looking at sort of robustness around those designs to ensure that when they're built, they actually perform like they should do.

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<v SPEAKER_1>Do you see, as well as the use of AI helping with kind of efficiency of vessels, whether that's operational or from the design, do you also see it as helping the, I suppose, enforcement side of the energy transition?

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<v SPEAKER_1>So in relation to kind of emission detection or those areas?

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<v SPEAKER_2>Yeah, we definitely see interest in that sort of utilization of how you spend the time that you might have.

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<v SPEAKER_2>We don't have enough resource to perhaps patrol all the vessels and to check emissions everywhere.

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<v SPEAKER_2>And so, and it's a very difficult and complex optimization problem with all the different vehicles that you might want to send out and check for emissions.

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<v SPEAKER_2>So we can start to build probabilistic models of which ships are most likely to be causing emissions based on their past histories, perhaps who they're owned by or where they're flagged, and start to then send our helicopters to the right places and utilize them the most effectively to check for those docks and socks emissions.

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<v SPEAKER_2>And that's something we're currently working on.

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<v SPEAKER_2>I think we'll see more of those sorts of things, not just in a perhaps emissions basis, but perhaps also around other types of things like human trafficking and drug smuggling, these sorts of areas that we're seeing other work in these areas now.

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<v SPEAKER_1>How fundamental do you think the role of AI will play ultimately in the energy transition for shipping?

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<v SPEAKER_2>I mean, I'm hoping it's a big part because that's where I spend a lot of my time.

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<v SPEAKER_2>But I also see a lot of benefits to this.

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<v SPEAKER_2>For me, in the short term, we can get really big efficiency savings without changing the design of vessels just in how they operate.

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<v SPEAKER_2>We've done some work that indicates maybe 18% savings just by operating vessels at their optimum.

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<v SPEAKER_2>And that's very exciting.

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<v SPEAKER_2>That should reduce the amount of fuel we're using and that should help with the transition to net zero because those fuels are going to be very expensive.

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<v SPEAKER_2>And an AI data science is a sort of cheap way of reducing the amount of net zero fuels we're going to need to use.

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<v SPEAKER_2>But then I think also there's a load of other complexities around the transition, around the supply chain, around where we actually get these fuels from, how we get them to the right place.

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<v SPEAKER_2>And I think that across the, do we have 1,700 ports or something globally, or maybe that's just even large ports?

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<v SPEAKER_2>Yeah, that's going to be really difficult to try and manage.

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<v SPEAKER_2>And so I think AI can help us in that sort of area as well.

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<v SPEAKER_1>It's hard to talk about AI, I think, without touching on autonomous shipping.

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<v SPEAKER_1>How do you think that the regulation and design of autonomous ships is developing?

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<v SPEAKER_1>And I suppose as part of that, I just wonder as well, how do you ensure that the design and the innovation progresses, but at the same time not losing the need to ensure safety?

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<v SPEAKER_2>Yeah, so I think this is really tricky.

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<v SPEAKER_2>The pace of change now is so fast and so rapid.

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<v SPEAKER_2>People want to get proof of concepts out very quickly, and the technology is constantly changing.

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<v SPEAKER_2>We also don't really know what's coming next.

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<v SPEAKER_2>So large language models are based predominantly on Transformers, which was developed in 2017.

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<v SPEAKER_2>And perhaps you're already seeing new types of large language models that aren't based on that architecture anymore.

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<v SPEAKER_2>So that's been a seven-year period between the fundamental science, the utilization within a commercial tool, and perhaps then move on to a new architecture.

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<v SPEAKER_2>I don't think we've ever seen that sort of pace of change so quickly.

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<v SPEAKER_2>So trying to develop an autonomy regulation is always going to be really tricky, especially in a slow-moving industry that we've traditionally been in.

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<v SPEAKER_2>So I think it's really nice that there's some regulation coming out in 2025 and that the people will be able to start utilizing autonomous ships within that regulation.

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<v SPEAKER_2>And we'll have to start to see how it evolves and start to understand how we can move rapidly with our pace of change.

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<v SPEAKER_1>Yeah, it's an issue, isn't it?

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<v SPEAKER_1>This need for moving fast, it seemingly in many areas of new technology and digitalization and in decarbonization, but also balancing that with the need for the safety side and the right regulations being in place.

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<v SPEAKER_1>And it is a really tricky balance to achieve, I think.

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<v SPEAKER_1>Well, I would say that there is obviously a move towards using AI, and there is obviously a lot of work being done, and we've already discussed areas where that's moving quite rapidly.

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<v SPEAKER_1>I do think there still remains quite a nervousness and hesitancy in the industry, and perhaps a lack of understanding when it comes to AI as well, and what it can really do for shipping companies.

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<v SPEAKER_1>How do you think we can overcome that kind of hesitancy and lack of understanding?

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<v SPEAKER_1>And do you have any tips for companies that might want to embrace AI technologies and implement them into their companies?

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<v SPEAKER_1>Yeah.

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<v SPEAKER_2>So I guess it's always difficult with new technology.

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<v SPEAKER_2>People are always a little bit cynical.

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<v SPEAKER_2>From a teaching perspective at university, there's a discussion around how much generative AI should be allowed within course works.

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<v SPEAKER_2>And sort of similar to debates that we had around calculators some years back, there's always a new technology.

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<v SPEAKER_2>It's difficult to understand fully what the implications will be.

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<v SPEAKER_2>And I guess that's the problem is that AI has benefits, but it will also come with some negatives.

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<v SPEAKER_2>There are no doubts around that balance.

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<v SPEAKER_2>I think the important thing is that people try and go into it with their eyes as wide open as possible.

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<v SPEAKER_2>And that means starting to understand what AI really can and can't do within the company.

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<v SPEAKER_2>I think, I guess, it's very similar to safety culture.

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<v SPEAKER_2>It probably starts at the top, and people at the top setting a tone for how they want to use these tools and to understand these tools correctly.

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<v SPEAKER_2>Perhaps not just asking that they implement AI within a company, but that they implement it as the correct tool for the correct job.

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<v SPEAKER_2>And then you'll start to see some successes, I think.

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<v SPEAKER_2>I think the other thing we spoke a lot about at the Singapore Maritime Institute Forum a couple of weeks ago was this idea of building foundations and having a strong foundation in data and understanding data before you move to some of the perhaps more cool toys that people are starting to see.

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<v SPEAKER_2>And perhaps companies are not really pulling that investment forward to do that.

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<v SPEAKER_2>But I think that that's the sort of thing where companies who are really investing in sort of databases and their data pipeline and getting good data engineers in before they move forward are starting to see the benefits a lot more.

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<v SPEAKER_1>Also, around the kind of hesitancy and nervousness, I think comes the thought that, oh, might AI replace my job?

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<v SPEAKER_1>Or is it going to be replacing people in the workplace in however many years?

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<v SPEAKER_1>What's your view on that?

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<v SPEAKER_2>Yeah, I mean, my job's to design AI, so I'm the last out the door in terms of job losses.

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<v SPEAKER_2>So I'm pretty much safe, I reckon.

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<v SPEAKER_2>But I think that we've seen a constantly evolving workforce in every country.

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<v SPEAKER_2>There's some really nice data from the US over the last 100 years, and the reduction in blue collar workers and the increase in professionals.

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<v SPEAKER_2>And every 10 years, you can sort of see the way in which that economy has changed substantially, and that the makeup of jobs is actually very fluid.

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<v SPEAKER_2>And I think that while we kind of may be cognizant of that, it doesn't feel that way sometimes.

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<v SPEAKER_2>And so we perhaps sort of fixate on some of these changes in what jobs will look like in 10 years time.

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<v SPEAKER_2>But whether we implement AI or not, we'll probably see quite a big change in that anyway.

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<v SPEAKER_2>So I think there's some additional elements that will obviously affect us more with AI.

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<v SPEAKER_2>I think autonomy is a good one.

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<v SPEAKER_2>Once that comes into things like driverless cars, driverless shipping, you will see substantial changes perhaps very rapidly, which we don't normally see.

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<v SPEAKER_2>And I guess it's really around those sorts of elements.

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<v SPEAKER_2>I think for most of us, it's just going to be an augmentation tool.

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<v SPEAKER_2>We're going to utilize it in a way that gradually creeps in.

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<v SPEAKER_2>I was looking at my emails earlier today, and I was writing on a Word doc earlier, and it was filling in all my text for me in advance.

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<v SPEAKER_2>And I was like, oh, I hadn't even pressed a button or asked for this to happen.

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<v SPEAKER_2>It sort of crept in and doing the job.

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<v SPEAKER_2>But it's not removed my job.

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<v SPEAKER_2>It just makes it a little bit quicker and allows me to spell correctly.

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<v SPEAKER_1>Yeah.

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<v SPEAKER_1>I think that's the thing.

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<v SPEAKER_1>Like you say, there's many uses for AI that actually should help a person's role not remove that person from their job.

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<v SPEAKER_1>And like you say, also, there'll be other reasons why jobs change over the coming years as well.

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<v SPEAKER_1>Do you think there are any issues around scaling up artificial intelligence then?

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<v SPEAKER_1>Do you think that we have got the right people with the skills and if not, what is being done to get those skills?

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<v SPEAKER_2>Yeah.

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<v SPEAKER_2>So I think the scale up is a big issue.

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<v SPEAKER_2>I think now building a data model is relatively trivial.

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<v SPEAKER_2>You could find people who can do that and do it for you quite well.

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<v SPEAKER_2>But if you want to do this on a large number of vessels or a large number of objects, it becomes increasingly difficult.

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<v SPEAKER_2>I'm talking to a car company who they have about 60 million of their cars on the road right now.

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<v SPEAKER_2>And by the time they go autonomous, they want a digital twin of every component on each of those cars.

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<v SPEAKER_2>So even if you call it 10, it's 600 data models and there's probably more than 10 components on most cars.

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<v SPEAKER_2>So you're talking perhaps in the billions.

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<v SPEAKER_2>So I think you could hire every data engineer right now.

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<v SPEAKER_2>And I don't think you could build and quality assure and reassess and visualize and communicate the data from those different models.

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<v SPEAKER_2>So I do think we need to look at how we scale up in the industry.

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<v SPEAKER_2>And I think that that's going to be important.

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<v SPEAKER_2>I think two things that were helping us with this.

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<v SPEAKER_2>One is no-code type of approaches, which allow us to build data models without actually doing the coding part.

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<v SPEAKER_2>And I think that's really democratizing AI.

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<v SPEAKER_2>And we can probably roll it out more widely across companies through those sorts of approaches and really nice sort of industry ready tools in that area.

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<v SPEAKER_2>And the other is around skills and making sure that all of our graduate engineers are aware of data science, statistics, machine learning, AI.

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<v SPEAKER_2>And I think in the UK, we're really well positioned for that.

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<v SPEAKER_2>Our universities are starting to move towards that.

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<v SPEAKER_1>It's comforting to know that it is being addressed at the kind of education level and working its way through the system.

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<v SPEAKER_1>And interesting that you make the point about data models without coding and the fact that that's something that could be rolled out more widely and more easily.

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<v SPEAKER_1>Do you think that this will then help kind of bridge the gap between those companies that perhaps aren't quite so forward thinking and don't have as much in-house expertise, perhaps the smaller shipping companies as compared to some of the first mover type shipping companies?

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<v SPEAKER_2>Yeah, so I guess it's sort of one of those yes no questions.

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<v SPEAKER_2>So I think it will help in terms of being able to allow them to develop the sort of tools that they want to use.

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<v SPEAKER_2>What it won't do is allow them to work out when they should use those tools and when using those tools might cause them an issue.

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<v SPEAKER_2>And so I think that that's around the wider support networks.

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<v SPEAKER_2>So I know there's a number of these that are starting to be funded around the UK in various areas.

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<v SPEAKER_2>Bridge AI is a really popular one, which helps a number of sectors find experts to give them advice.

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<v SPEAKER_2>There's the Advice Center of Excellence, work from the Department of Energy Security and Net Zero, which the Turing is part of, with the digital catapult and the energy catapult, looking at how we can support decarbonization through AI.

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<v SPEAKER_2>And some of that is helping companies start to understand when these tools can be used and what they can actually do.

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<v SPEAKER_2>And I think that, and starting to make that business case, which I think is the really important first step.

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<v SPEAKER_2>The node code then helps them with the implementation when they've decided to go ahead and found something that they can actually do.

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<v SPEAKER_1>Before ending the podcast, I did want to just speak to you about kind of the human machine learning element of AI, because I know there is work being done around that.

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<v SPEAKER_1>Can you explain a bit about how human learning is brought into the design of AI?

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<v SPEAKER_2>Yeah, so I guess the AI work that we do tends to be quite focused at specialists, but actually really what we want is for non-specialists to interact with these tools.

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<v SPEAKER_2>So I think a really nice example is the voyage optimization software we've been working on.

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<v SPEAKER_2>And we've got that operating on ships, but the ship's captains don't always follow the routes.

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<v SPEAKER_2>And that's because sometimes the routes that the tool is suggesting are quite different from what the ship captain would normally follow.

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<v SPEAKER_2>And they've got no way of questioning or discussing with the AI around why it's making that decision.

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<v SPEAKER_2>They either choose to just follow the tool or they choose their own intuition.

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<v SPEAKER_2>And they tend to follow their own intuition.

00:19:37.600 --> 00:19:40.100

<v SPEAKER_2>And that's like perfectly understandable.

00:19:40.100 --> 00:19:51.740

<v SPEAKER_2>What we'd really like to do is get the AI tool to be able to communicate why it's chosen this different route and to engage with the ship's captain so they can start to see, oh, okay, maybe there is a different way of doing this route.

00:19:52.400 --> 00:20:01.100

<v SPEAKER_2>And I think that's especially important in things like climate change, where we might see quite big changes to how we want to ship routes or new technologies.

00:20:01.100 --> 00:20:07.400

<v SPEAKER_2>For example, like Wind Assist, where we're going to have to follow new routes to make the most of those technologies.

00:20:07.400 --> 00:20:11.780

<v SPEAKER_2>So there's some really nice ways in which we're doing that.

00:20:11.780 --> 00:20:27.120

<v SPEAKER_2>We're particularly interested in bringing humanities more in and the humanities disciplines into AI to sort of understand the tech, help us understand how the technology interacts with people, so that it's easier to communicate with the AI and understand sort of what it's trying to do.

00:20:27.120 --> 00:20:29.320

<v SPEAKER_1>I mean, it's absolutely fascinating.

00:20:29.320 --> 00:20:40.900

<v SPEAKER_1>And I have to say, for me, someone who has limited technology expertise, it's kind of hard to comprehend how that works.

00:20:40.900 --> 00:20:44.180

<v SPEAKER_1>But it's, like I say, it's absolutely fascinating.

00:20:44.180 --> 00:20:48.820

<v SPEAKER_1>And thank you very much, Adam, for the engaging insight on this episode.

00:20:49.220 --> 00:20:49.400

<v SPEAKER_1>Cool.

00:20:49.400 --> 00:20:51.040

<v SPEAKER_2>Thanks very much for having me.

00:20:51.040 --> 00:20:53.060

<v SPEAKER_1>And that's it for today's episode.

00:20:53.060 --> 00:21:01.900

<v SPEAKER_1>Remember to listen to the other episodes in the mini series, where we look at the challenges and opportunities for shipping in this transition to a more digitalized industry.

00:21:01.900 --> 00:21:10.220

<v SPEAKER_1>You'll find the Alongside podcast in this mini series on the NorthStandard website at northstandard.com or wherever you get your podcasts.

00:21:10.220 --> 00:21:13.600

<v SPEAKER_1>You can also click follow to ensure you don't miss an episode.

00:21:13.600 --> 00:21:16.740

<v SPEAKER_1>So from me, Helen Barden, thank you for listening and bye for now.