

The next chapter

We all like to look to the future. But planning our next holiday is often about as far as many of us get. For futurologists Nick Colosimo and Dr Ian Pearson, figuring out what the next few decades might bring – in terms of technology, geo-politics, the environment and so on – is all in a day's work. Nick is BAE Systems' Principal Technologist (Disruptive Technologies), while Dr Pearson was a full-time futurologist from 1991 to 2007 and now runs Futurizon, a small futures institute. He even invented text messaging. They are both innovators and thought leaders in every sense of the word. We caught up with them when Ian came to Warton to give a talk on futurism and some ideas the pair have been working on.

Q: How frustrating is it being a futurologist when the potential of your ideas, and the opportunities that go with them, can be missed?

Ian: I don't get as frustrated as I used to. To put this in perspective, I had lunch with two or three friends and we wrote down the ideas we came up with during one particular year when we worked in industry. Then we estimated the market capitalisation of the companies that are now doing those exact things. It added up to about £100bn and the companies we worked for had saved probably £100,000 by not developing them! That sort of thing can be incredibly frustrating. One reason often given for why new ideas aren't followed is that they aren't core to the existing business. But my view is that you have the skills, why not?

Companies like Microsoft and Facebook are run by executives who invented the technologies and thoroughly understand what they're doing. That's the difference between Silicon Valley and UK companies. Here there can be a tendency to put an

accountant at the top who just wants to save money. Anyone can save money by cancelling projects; however, if you cancel something and save £100,000 but lose out on a £5bn market then it's not really the best business model is it?

It applies not just within companies, but within the whole of society and even if you do launch something, then the media can be negative because it can immediately jump on an idea and pull it apart with negative headlines. If you're a proper entrepreneur, which I'm not, you just sort of bulldoze through and make things happen anyway. I'm an ideas person working in lots of different fields, and for me it's easier just to move on to another field. I just write the idea and move on to something else.

Nick: Yes, it can be a frustration and I think there are two dimensions to this. On the one hand we're all individuals with our day jobs, with things that we've got to get done to deliver on our commitments. But there's a clear need to kind of break out every once in a while, to look at the bigger picture and see

what's out there. That way we can re-evaluate what we're doing and ask questions like: Why are we doing it? Is there a better way of doing it? And, can we do something different?

The other dimension is when you do come up with the idea, you need a reciprocal arrangement with your senior leadership. If you tell them you've got a great idea then you want the leadership to say, "Great. We're looking for ideas and we like certain elements about your idea." Then it would be good if you could just go and pursue it. Personally, I think we've got to make a cultural shift as an organisation, both in terms of everyone being too busy with their day jobs, but also in terms of the support that they get from their management to encourage a bit of disruptive thinking. It's a two-way street so we have to be able to express the ideas in business terms as well. One initiative that was kicked off last year was an Innovation Fund, led by Maureen McCue which is encouraging that kind of thinking. People are coming forward with some good ideas and management are supporting them. We've seen some good results from it so far.



Where do you see the big technology areas opening up in the years ahead?

Ian: Space is an increasing business opportunity – and in the not very far future. The costs of getting into space are coming down to the extent that we’re going to see things like asteroid mining coming forwards. Traditionally, we’ve put that in the 2050 time frame, but I wouldn’t be surprised if it was five or ten years sooner.

It might be the early or mid-2030s before the space industry really picks up but it will be a vast business to get into. A company like BAE Systems, with its existing expertise, could expand into it organically because it has an advantage over other people coming in from scratch.

Given some of the manufacturing and analytical capabilities, there are other areas that this business could look at. I think things like self-driving car systems are probably worth considering. At the moment they’re being led by the car industry because they want to preserve their share in the market but they want expensive cars, with expensive lithium batteries and expensive Artificial Intelligence on board. But you don’t need those. All you need is a simple box with the electromagnetics on the bottom to propel it. It’s a fairly straightforward system which is pretty much off the shelf. Any company with a high degree of expertise in technology would be able to compete head-on and win against a lot of the car companies who don’t understand the IT. The proof of that is that 70% of the cars coming off the production line are hackable.

Nick: For me, we are literally on the verge of a number of technological revolutions. Somewhere in the 2020s or 2030s we will see all kinds of incredible materials technology start to emerge. Another thing which we should look at is around computing power. Moore’s Law (the doubling of processing power every 24 months) will continue one way or another so in ten to 15 years’ time, we’ll have vast amounts of computing power available. The big question is, what can we do with it?

AI is one area. The thing that we’ve got to do as a business is ensure that we can employ AI to make cost savings and perhaps

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to achieve new things like the design of the next product, or perhaps on board an aircraft to process certain things, but we’ve got to do it in a responsible way. We’ve got to make sure that our employment of AI is done for the right reasons, in the right context and so, while we should embrace it because it’s a major disrupter, we’ve got to be responsible and thoughtful about its adoption.

You’ve been working on some ideas together – graphene used to help launch things from a high-altitude platform – how feasible do you think these ideas are?

Ian: I’ll not go into detail here but essentially we’re talking about something which just requires a bit of graphene string. How difficult can it be really with a dedicated amount of research and development to work out how to make graphene in industrial quantities?

Most of the labs working with graphene at the moment have fairly small budgets. With the right investment, you could develop that sort of thing, given that if you do, the costs of developing things from it would be ridiculously small. If, for our idea, all you need is a couple of rings and a bit of string attached to the front of a spacecraft to get it into orbit, how can that be expensive compared to a £65m rocket?

Anyone doing that could capture large amounts of that industry. It might change how you do drone technology, it might totally, dramatically change the way you do the sensor technology too. For example, if you’ve got a floating high-altitude platform at 100,000 feet that’s got sensors embedded

on it, you don’t actually have to put all that intelligence inside your aircraft.

Given a large percentage of the cost of a combat aircraft is electronics, if you can outsource all of that to a high-altitude platform then the overall costs would be far less, through taking this system of systems approach. You’d be able to build a very low cost, very large aeroplane fleet that could outperform others because the weight is less. You could come up with a very sophisticated drone system, co-ordinated by a high-altitude, heavily embedded sensor network array. There are lots of ways you could solve this particular problem – and all of them could challenge the existing industry.

Given the technology advances you see coming, what will be the key characteristics businesses need in order to survive and prosper in the future?

Ian: The number one skill you need to have is adaptability and agility. You’ve got to be able to change what you do quickly and adapt to an entirely new area. If you can do that, you might only be number two in every single area, but you survive. The number one-ranked business is vulnerable and can get wiped out because the landscape has changed. If you’re number one in a particular area you’re probably vulnerable in lots of ways that you don’t fully understand yet because you’re not an expert in the areas that are going to threaten you. But the IT industry is threatening everybody.

Nick: For me it’s about having the right kind of foresight – one which is understood at all levels in the organisation – so that you know what’s coming and what might happen. If you can combine that with organisational agility, then you can see what might happen and start to prepare yourself organisationally to meet those challenges.

There will be new challenges into our existing markets, but also again, as Ian says, new opportunities that we can seize in new and adjacent markets. So being fleet of foot and having foresight are really the key things.

Elon Musk said earlier this year that AI is the biggest risk civilisation faces — what do you think?

Ian: I think he has a strong point, Facebook’s Mark Zuckerberg told him off for doom-mongering, but I’ve listened to both sides of the argument.

I don’t believe that everyone out there is a nice guy – whether they’re terrorists, aliens or AIs. You can’t assume they’re all going to be nice. It could be just you’re in the way. We just might not register as important enough to feature in their calculations.

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we have fully conscious, sentient people with reasonably good IQs. There’s nothing in principle to stop you making computers on exactly that same principle, but the difference is the levels of speed that you can get with a computer. Inside your head signals travel at 200 metres per second, inside optical fibre, they move at 200 million metres per second. In your brain neurons fire at 200 Hertz, inside a modern chip, they go at two billion Hertz! That means you can make a pot of yoghurt-like computing gel, that can contain enough computing power to be the equivalent of every brain in Europe – 500 million people.

If you’ve got something which is 500 million times smarter than you are, it could be just a productivity aid – a slightly more advanced form of Google say. But it’s probably going to be your boss and it’s got every capability of taking over every single system that humans run because it’s so much smarter. It can move, it can hide itself, it can find every bug in every system pretty much instantly, and before breakfast it could take over the entire world. We see that all the time in sci-fi. Making an argument that just because something’s super smart means it’s going to be evil, well there’s no guarantee of

that, but that’s not much of a defence really, is it?

Nick: I agree with Ian’s sentiment about AI. It offers tremendous prospects for mankind, in terms of medicine and solving the disease problem, or issues like running out of finite resources on the earth or where our food is going to come from as the population continues to grow. There’s great potential there, but it’s got to be used in the right way.

I think that over the coming decade, we’ll start to experience some of the downsides that may come with AI. If we are thoughtful enough as a civilisation we might recognise those downsides and mitigate their further propagation – putting the right regulations and rules in place to protect us. We may also find out what countermeasures we may have to employ, to stop an AI versus AI arms race. We need to ensure humans remain at the centre of decision-making, but are able to make better, faster, much more informed decisions. If we can do all that, we can embrace the good sides of AI and mitigate much of the downside.

That’s the utopia. But it’s by no means guaranteed – we’ve got to work very, very hard

at it. We have a responsibility in our business to make sure we’re using AI in the right way – and I believe we are.

Ian: In the short term, one of the things we should expect to see over the next two or three years is the big social media and IT companies using AI to target things like hate speech. That’s fine, nobody objects to getting rid of hate speech. But how do you define it?

An awful lot of perfectly decent people might find themselves completely disenfranchised because whatever they’re saying isn’t getting anywhere, it’s getting filtered out. It might even mean that their email account is cancelled.

There’s a danger there that a company could want an entire society to go along with their particular ideology. If you agree with that ideology, it’s fine, if you don’t, you’re stuffed and I think that is the beginnings of potential conflict. If you’re alienating half the population who don’t agree with your ideology, they’re going to get pretty cheesed off. This, along with the whole fake news thing – where everybody accuses everything they don’t like of being fake news – well, it’s all potentially very 1984-ish.

