

MAS RWG 2017

Day 2 Keynote presentation: Friday 17 September 2017.

Why is Automation a good thing for Society and Business?

The rapid proliferation of automation, and autonomy, offers a significantly different future for all of us; as individuals, as society, and as businesses. In this talk, I want to set out my own vision for how I see the future of the Marine and Maritime Industries, anticipating the rapid rise of autonomous systems, intelligent systems and other emergent technologies, and how they and other potentially fundamental changes, such as those postulated in the Fourth Industrial Revolution, will change our futures.

Before I begin, I would like to thank my former colleagues in QinetiQ, who have helped develop my thinking on this topic. If this talk sparks your interest in this area, the thinking here is expanded more fully in the latest of the Global Marine Technology Trends work developed by QinetiQ, Lloyd's Register and the University of Southampton. This report provides a wider perspective on Autonomous Systems, exploring aspects such as legal and regulatory issues, in addition, and, in my view more importantly, to the people element, which is often overlooked in the race for technology.

Strategic global trends are shaping the future of work and workplaces, in ways that will have profound implications for the Maritime Industries. The coincidence of rapidly changing technology, socio-demographic shifts, and political and economic uncertainty, are changing the nature of work and the working environment. In tandem, the nature of trade is undergoing a profound shift in an increasingly digital, interconnected world and, if we connect that with, for example, the advent of additive

manufacturing technologies, we could see disruptive trade patterns emerge. These developments can only accelerate; and with that, the traditional enterprise boundaries, skills, and resources, as we know them, may fragment against fierce competition from potentially radically different businesses and industries, as this fourth industrial revolution takes hold.

Marine Autonomy, and the advent of unmanned ships, is a pivotal moment for all of us in the industry; opening opportunities to develop new business models, new regulatory approaches, new insurance solutions, and even opportunities to create new markets. It seems that virtually every week we see press releases on unmanned ships, and new reports from our universities and research institutions on applications of autonomy. In October last year, the Royal Navy, through the Unmanned Warrior exercises, demonstrated the 'art of the possible' with a number of world firsts in co-operative operations between unmanned vehicles in sea and air, supported by a highly collaborative industrial enterprise.

Of course, we are not the only industry pursuing these solutions. They are developing apace in areas as diverse as healthcare and medicine, automotive, and Fintech, all of which are receiving significant levels of funding through focussed and collaborative approaches to Government, with a clear sense of purpose. Importantly, they have also demonstrated a willingness to change both culturally and in business practices.

We will need to engage with these developments closely. We will face new entrants (think Tesla in the automotive industry), and disruptive business models (think Uber) as technologies and innovation from other sectors seek opportunities to expand.

Taking a shamelessly parochial UK view for a moment, I would suggest that we as a Marine Industry have yet to fully embrace these changes. Whilst some progress has been made, such as the Maritime Growth Study which highlighted a need for unified action, and other groups, such as Maritime UK are actively pursuing this agenda, we have to ask ourselves - are we moving quickly enough?

So, lets start by asking, what is the evidence that we are not? Over 4 years ago now the Marine Industries Alliance published a Strategy for Growth. This strategy recognised, what was then, the UK's leading position in the field of autonomy, building upon our innovative community of SMEs, academia and the National Oceanography Centre. We were, and are, actively deploying unmanned systems for scientific purposes.

Working with the MIA, InnovateUK helped with the funding of a Marine Autonomous Systems call, and the MIA Regulatory Working Group was also formed. But this has not proved sufficient; Despite the efforts of a "few good" women, and men, in the enterprise, the UK has lost ground; other national governments and industries have responded quickly, supporting breakthroughs and taking a long term view of the opportunities that may arise.

So, is it possible that the case for change has not been articulated clearly enough? This brings me to the question "why is autonomy a good thing for business"? It will, in my view, start to fundamentally change the basic structures of a traditional industry, an industry that has evolved incrementally over centuries and where the UK has been at the forefront of developments, an industry that will now have to adapt, look at itself in a new way and start to take radically new approaches if we are to maintain and grow our market share. New concepts, technologies and solutions are required, fundamental

organisational structures and functions will need to change, and we will need *strong and stable* leadership from Government to support us. Much as we have seen in the aerospace industry, we now need similar levels of investment. As a maritime nation dependent upon the sea for trade, we have a lot to lose BUT even more to gain through the development of a collaborative enterprise capable of leading, rather than responding to these changes.

There is evidence that shows that maritime industries are already adopting AI and automation technologies, motivated by high expectations of cost savings, and efficiency gains. Over the next 5 years, we must expect to achieve even higher levels of digitisation and integration¹ which will deliver even greater productivity and efficiency. However, we must also face up to the risk that if these new technologies are implemented solely to drive efficiency and cost savings, then the digital shift will be accompanied by job losses as automation increasingly substitutes for people².

So, this raises a further point: “is Autonomy a good thing for people and society?”. We cannot talk about unmanned systems without addressing skills and social aspects. I recognise that it is hard to see beyond the technology, as it pervades every aspect of our lives, driven by colossal investments in consumer solutions, but the press is full of reports about job losses, de-skilling, technology elitism and so forth. So, is this real?

It is evident that this automation and artificial intelligence technologies are being fundamentally shaped by an efficiency and productivity-driven consumer business context, and largely by technology companies. Perhaps because of this, as I highlighted

¹ PWC, Global Industry 4.0 Survey – Industry key findings, 2016, www.pwc.com/gx/en/aerospace-defence-and-security/publications/assets/industry-4.0-aerospace-key-findings.pdf.

² House of Commons Hansard, Fourth Industrial Revolution, 8 Sept 2016, <https://hansard.parliament.uk/commons/2016-09-08/debates/16090835000001/FourthIndustrialRevolution>.

earlier, technological changes are increasingly focused on substituting, rather than enhancing, people in the workplace, as a way to drive down labour costs. But, is this really the route we want to take to shape our seascape? It offers great opportunities, but we need to be aware of the unintended consequences.

As 4IR technologies become mainstream, the labour landscape will undergo profound changes. Some predict catastrophic unemployment as jobs are 'hollowed out' and automated. Others foresee a less turbulent scenario, where the types of employment available change as new jobs that compensate for those lost are created³. My view is that if technology adoption, specifically automation, continues to be driven by short-term business needs, then the former scenario is more likely.

We should also recognise that attitudes to long-term careers (jobs for life) are changing. Predominantly driven by the millennial / post millennial generations looking for financial rather than job security, along with modern working environments, flexible working unconstrained by traditional job factors, a willingness to blur work-life boundaries, and high expectations of constant social connectivity. These do not play well into an industry where long periods are spent at sea and with very limited connectivity.

Less well understood is that current trends signal an older, multigenerational, more international and female workforce⁴, along with a gig-style economy driven by transient, on-demand or crowdsourced labour models⁵.

³ M. Carney, Uncertainty, the economy and policy, June 2016, www.bankofengland.co.uk/publications/Documents/speeches/2016/speech915.pdf.

⁴ UKES, The future of work: jobs and skills in 2030, www.gov.uk/government/publications/jobs-and-skills-in-2030.

⁵ The Economist Intelligence Unit, www.eiuperspectives.economist.com/sites/default/files/Preparingdigitisationworkforce.PDF.

Evidence also suggests that people will be working for longer, leading to multi-generational workplaces where age profiles of 18 to 80 could become the norm^{Error! Bookmark not defined., 6}. We need to adopt new ways that support multi-generational working and through life training and development. We have to ask ourselves, in an adversarial talent market, how can the Maritime sector create a compelling demonstration of its worth, and exceed people's expectations?

We should note that there are two key components at play here: the employer and the employee. Crucially the answer requires us to recognise that only one of these components is under our control. Instead of concentrating on how to make potential employees want to join, or current personnel stay, we should instead look at ways to position Maritime as the employer of choice, so that this happens organically. A disruptive 4IR context could actually provide a range of opportunities to do so.

In addressing these challenges in other industries, the ethos of collaboration and co-operation that underpins the enterprise is significant. It is unlikely that we will be different; however, how we develop and apply these emerging technologies is key. Automation will transform maritime operations, but instead of using technology purely to drive cost efficiencies, there is an opportunity to gain a strategic edge through role augmentation and human-system partnerships. Effective integration of automation and highly trained multi-demographic personnel will deliver versatile capability.

In summary, I believe that Automation is a good thing for business. Within the maritime sector we have a number of challenges that will force us to adopt it. However, it is not so clear to me that it is

⁶ IoD, Lifelong Learning: Reforming education for an age of technological and demographic change, Policy Report, March 2016, www.iod.com/Portals/0/PDFs/Campaigns%20and%20Reports/Employment%20and%20Skills/Life%20Long%20Learning%20Report.pdf?ver=2016-09-14-124014-230.

necessarily wholly good for society. It will clearly change the nature of work, reducing drudgery, improving working environments and creating more interesting work, but it could also more generally drive greater competition and social resistance.

We need to address this by extending our strategic planning horizons to enable a long-term transformational approach to workforce capability that 'reads' these strategic trends to anticipate their impact on the 'future of work', and responsively adapt recruitment, selection, training, deployment and retention. For this we need to be pragmatic, recognising that planning should not be based on a single, 'perfect' future, but focused on delivering resilience against a range of possible future scenarios, integrating innovation and skills to create a dynamic industry, resilient to competition and leading rather than following change.